

# Project: I-405 Renton to Bellevue Express Toll Lanes and Widening

Owner: WSDOT

I-405, Renton to Bellevue Widening & and Express Toll Lanes Project

## DOCUMENT REVIEW

- ☒ APPROVED, NO EXCEPTION TAKEN
- ☐ APPROVED AS NOTED
- ☐ RESUBMIT, REVISE AS NOTED

REVIEWED BY: J. Warren DATE: 1/12/22

Review is for general conformance with contract or design documents. Sole responsibility for correctness of dimensions, details, quantities, materials, and safety during fabrication and erection shall remain with the contractor.

## Bridge 25E - May Creek (Phase 1) Girder Erection Plan

Submitted in Accordance with  
WSDOT Standard Specification,  
section 6-02.3(25)N

Prepared By:  
Ilima Alexander  
Flatiron Lane A Joint Venture

Date  
12/09/2021

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300T Load Block

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550T Crane Catalog

550T Wire Rope

550T Load Block

550T Outrigger Loads

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RECo Memo

## Narrative: Prestressed Concrete Girder Erection Plan

### Lift Description

Setting girders on top of the pile caps for spans Bridge 25E Phase 1. Ness Campbell Crane will be operating cranes and picking all of the girders. FLJV will provide the riggers and signaller. The lift will consist of a two crane pick, which will be a GMK7550 and a GMK6300. The cranes will rig up to the end of each girder. There is a pick point located 10' from the end of each girder for placement. The following pages show locations of cranes, outriggers and girder delivery trucks relative to walls 7.10R and 7.15R, temporary soil nail walls 7.10R and 7.15R, existing May Creek bridge, May Creek waterline and I-405 traveling public.

### Prior to Girder Erection

WSDOT Standard Specification 6-02.3(25)N, the concrete in piers shall reach at least 80 percent of design strength before girders are placed on them.

Oak blocks will be placed at girder centerline, as shown on RFC plans. Oak block height shall not exceed width.

Girders will be staged in the work zone located on the shoulder between the I-405 northbound on ramp at NE 30th Street and May Creek bridge. Overhang brackets will be installed during the day, prior to girder set.

Cranes at pier 1 and pier 2 will sit as far from walls 7.15R and 7.10R as feasible. Due to limited space between wall 7.10R and temporary soil nail wall 7.10R, the crane outrigger will be supported over the wall strap zone. The crane sitting behind pier 2 will not encroach on wall 7.15R strap zone. Outrigger pad size and reactions have been checked against the embankment material and the RECo strap zone. A memo from RECo has been included with this submittal.

Girders will be set under a double right lane night closure. Allowable closures are included in this submittal.

### Set Girders

Girder erection sequence shall be E, F, G, H. Girder stresses during progressive stages of erection have been analyzed in the Bridge 25E RFC calculations and in this submittal.

Two cranes will be used to pick the girders. Crane cut sheets are attached. The girders will be hoisted by the lifting embedments at the ends, keeping the girders plumb and upright. Girder weights, lift points and lifting embedment details can be found in the girder shops drawings, submittal 311.

Girder E will be braced at midspan to the existing bridge until adjacent girder is set and midspan x-bracing is installed. All girders will be braced at each end and at midspan to prevent lateral movement or rotation. The bracing will be placed prior to the release of each girder from the cranes. See submittal 361 for falsework/formwork and girder bracing plan.

### Operator Communication Plan

All crane operators will have a designated ground man. No crane pick is made without the crane operator being signaled by the ground man.

Requirements per WSDOT Standard Specification 6-02.3(25)N - Prestressed Concrete Girder Erection

The erection plan shall provide complete details of the erection process including at a minimum:

1. Temporary falsework support, bracing, guys, deadmen, and attachments to other Structure components or objects;  
Please see submittal 361 'Seg 1b May Creek Bridge 25E/W Overhang/Girder Bracing/Soffit Design RFC'
2. Procedure and sequence of operation;  
Included in this submittal.
3. Girder stresses during progressive stages of erection;  
These checks were performed as part of girder design. Please see submittal 409.
4. Girder weights, lift points, lifting embedments and devices, spreaders, and angle of lifting cables in accordance with Section 6-02.3(25)L, etc.;  
Please see submittal 311 'Seg 1b - May Creek Bridge 25E/W - CTC Prestressed Concrete Girder Shop Drawings'.
5. Crane(s) make and model, mass, geometry, lift capacity, outrigger size, and reactions;  
Included in this submittal.
6. Girder launcher or trolley details and capacity (if intended for use); and  
Not intended for use.
7. Locations of cranes, barges, trucks delivering girders, and the location of cranes and outriggers relative to other Structures, including retaining walls and wing walls.  
Included in this submittal.



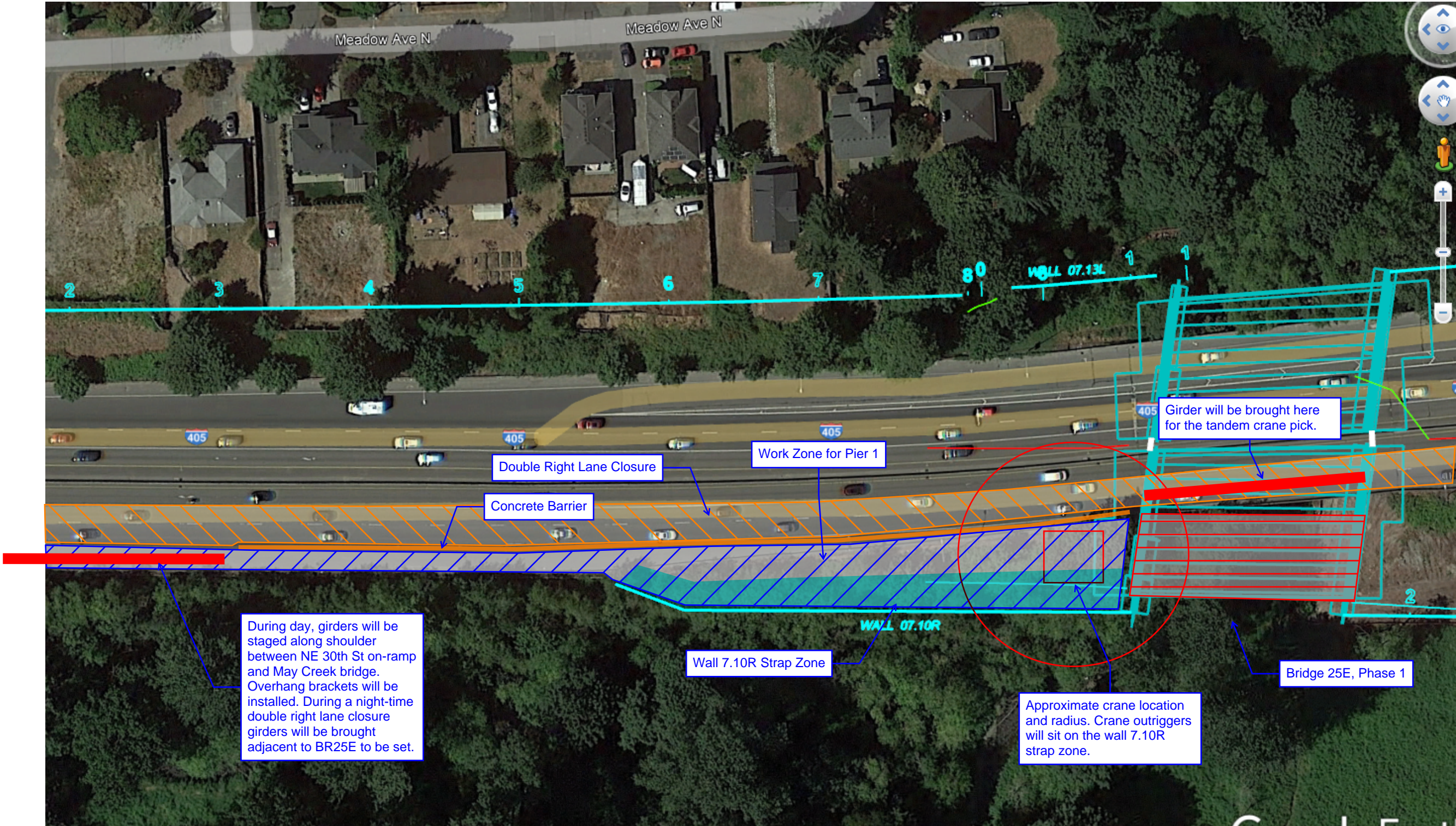
# Allowable Lane Closures

Girders will be set under a double right lane night closure. The allowable closure hours are highlighted below.

<b>Northbound I-405, SR 900 East/Park Drive Exit Ramp to 112<sup>th</sup> Avenue On-Ramp (MP 5.24 to MP 9.59)</b> <b>(Existing Configuration: 1 HOV + 2 GPs)</b>								
Allowable Closure Times	<b>Sunday Night to Monday Morning Only</b>		Monday Night to Tuesday Morning Tuesday night to Wednesday Morning Wednesday Night to Thursday Morning Thursday Night to Friday Morning		Friday Night to Saturday Morning *		Saturday Night to Sunday Morning	
HOV Lane Closed	9:30 p.m.	5:00 a.m.	8:45 p.m.	5:00 a.m.	10:00 p.m.	7:00 a.m.	10:30 p.m.	8:00 a.m.
2 Left Lanes Closed	11:15 p.m.	4:15 a.m.	11:15 p.m.	4:15 a.m.	11:59 p.m.	6:00 a.m.	11:59 p.m.	7:00 a.m.
Right GP Lane Closed	9:45 p.m.	4:30 a.m.	9:00 p.m.	4:30 a.m.	10:00 p.m.	7:00 a.m.	10:30 p.m.	8:00 a.m.
Two Right GP Lanes Closed	11:15 p.m.	4:15 a.m.	11:15 p.m.	4:15 a.m.	11:59 p.m.	6:00 a.m.	11:59 p.m.	7:00 a.m.

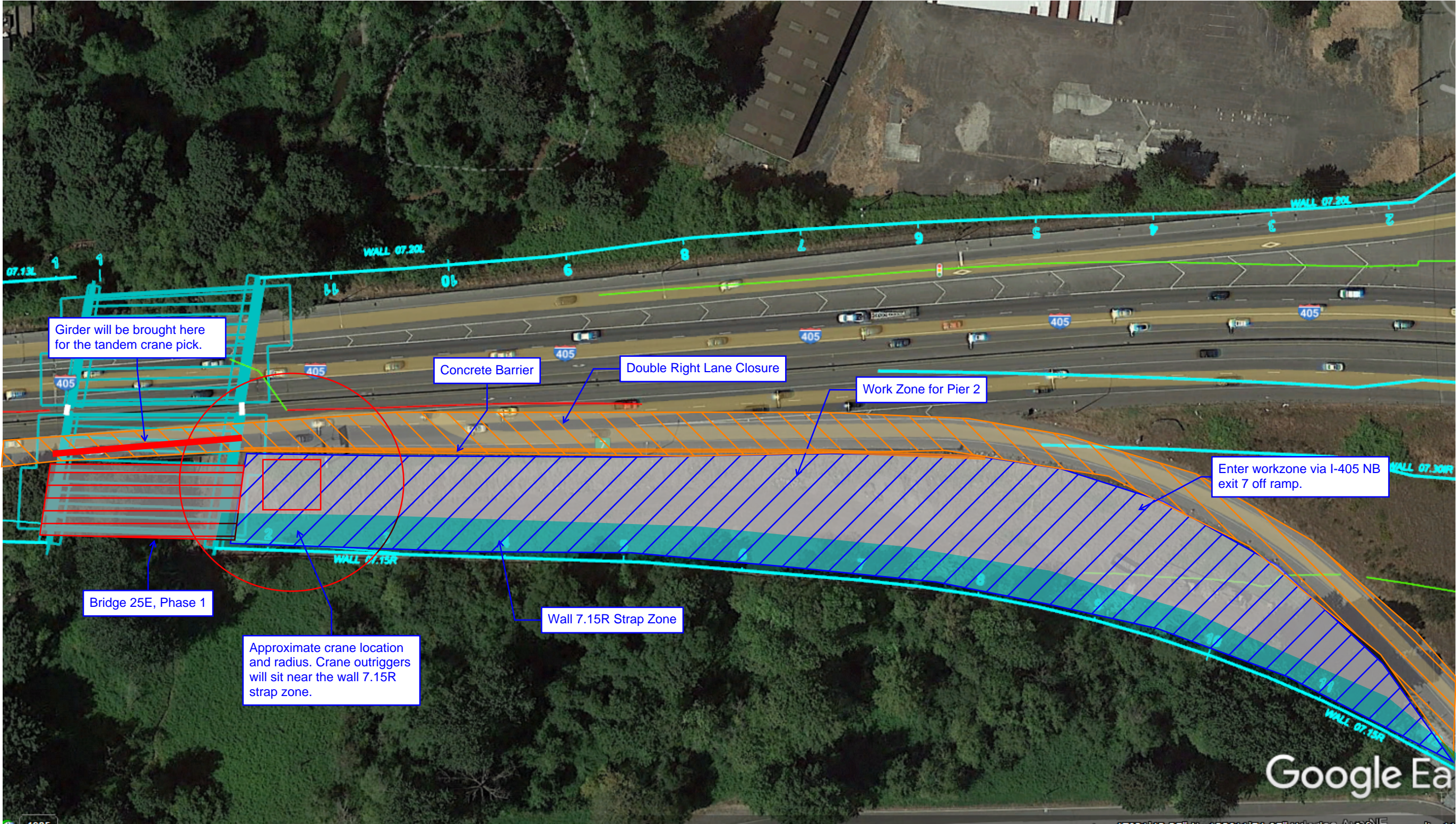


PLAN VIEW  
BR25E GIRDER SETTING SITE PLAN - PIER 2





PLAN VIEW  
BR25E GIRDER SETTING SITE PLAN - PIER 1







# ELEVATION VIEW BRIDGE 25E PHASE 1 GIRDER SET

550T GMK7500  
MAX RADIUS = 70'  
BOOM LENGTH = 115.9'  
CAPACITY = 140 KIP

300T GMK6300  
MAX RADIUS = 45'  
BOOM LENGTH = 72'  
CAPACITY = 142 KIP

SEE CRITICAL LIFT PLAN TO SEE  
DETAILS OF LOAD AND %  
CAPACITY OF EACH CRANE.

TOP OF WALL 7.10R

ACCESS ROAD

SHORING /  
I-405 ROADWAY

27'-11"

30'

TOP OF WALL 7.15R

WALL FILLED TO THIS ELEVATION  
TO CREATE CRANE PAD & ACCESS ROAD

BOTT OF WALL 7.10R

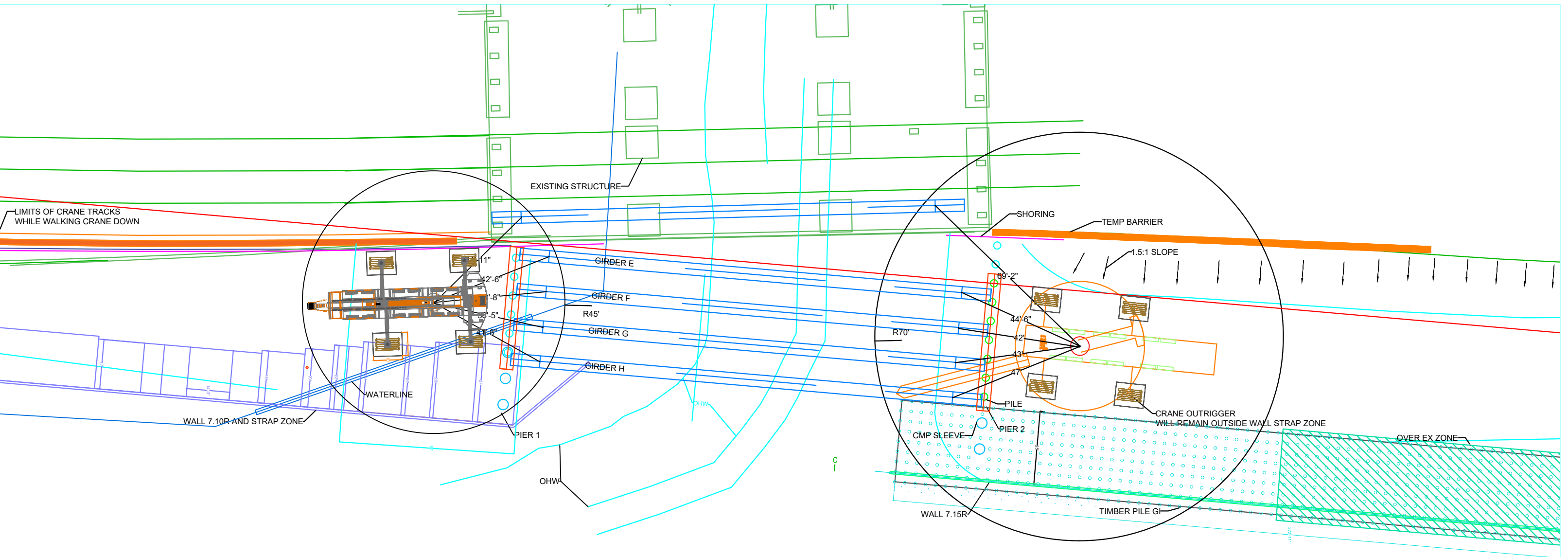
WATERLINE IN  
CASING

BR 25E PILE

EXIST. BRIDGE FDTN

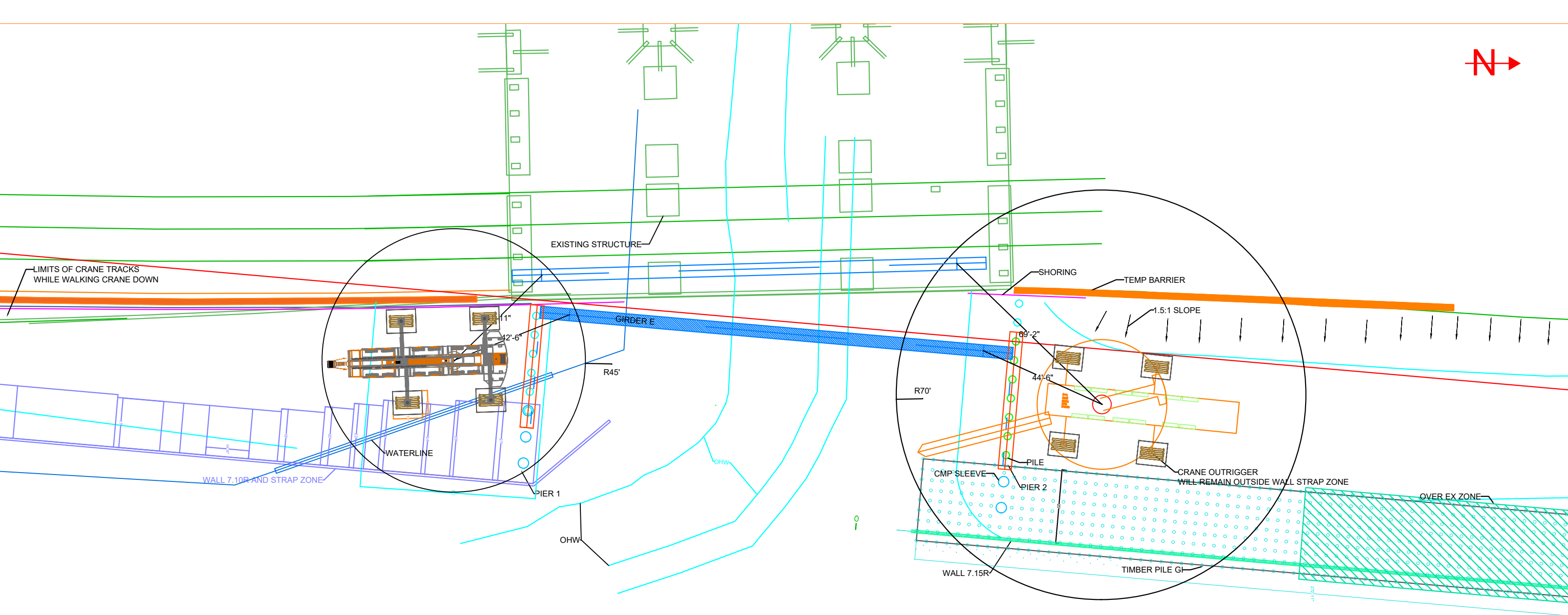
EXIST. BRIDGE FDTN

BOTTOM OF  
WALL



- NOTES:
1. GIRDER ERECTION SEQUENCE: E, F, G ,H
  2. SEE SUBMITTAL 361 FOR GIRDER BRACING PLAN

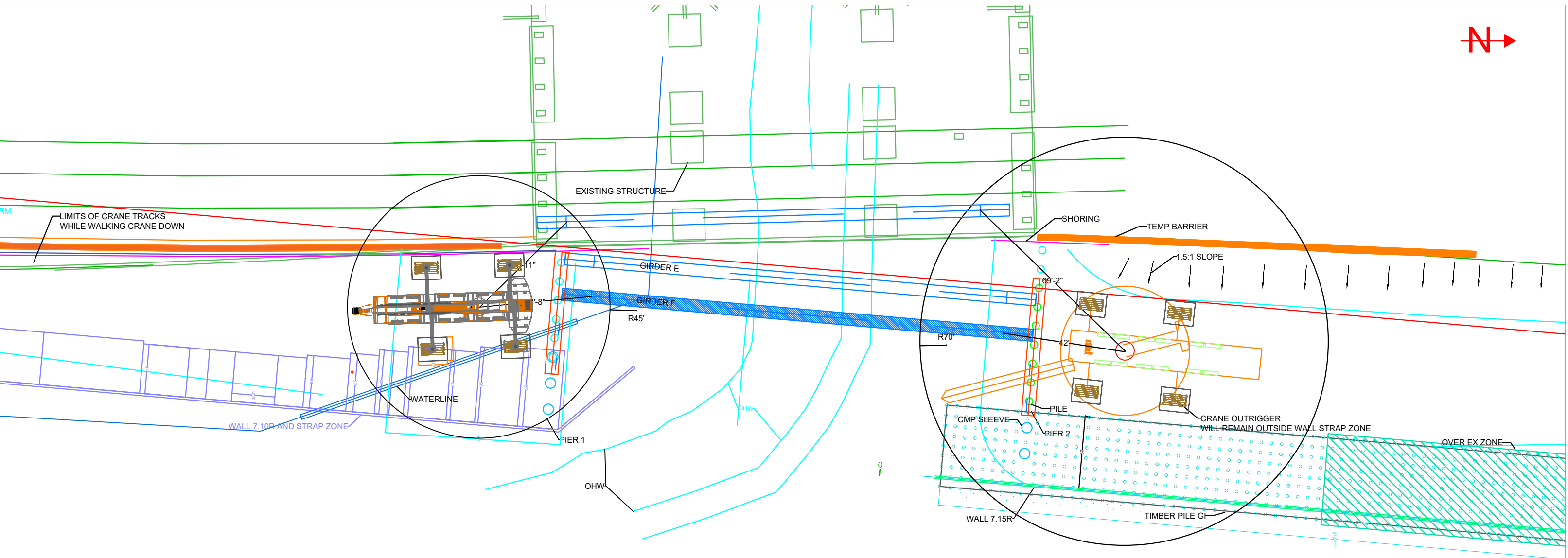
PLAN VIEW  
SUMMARY BR25E GIRDER SET PLAN



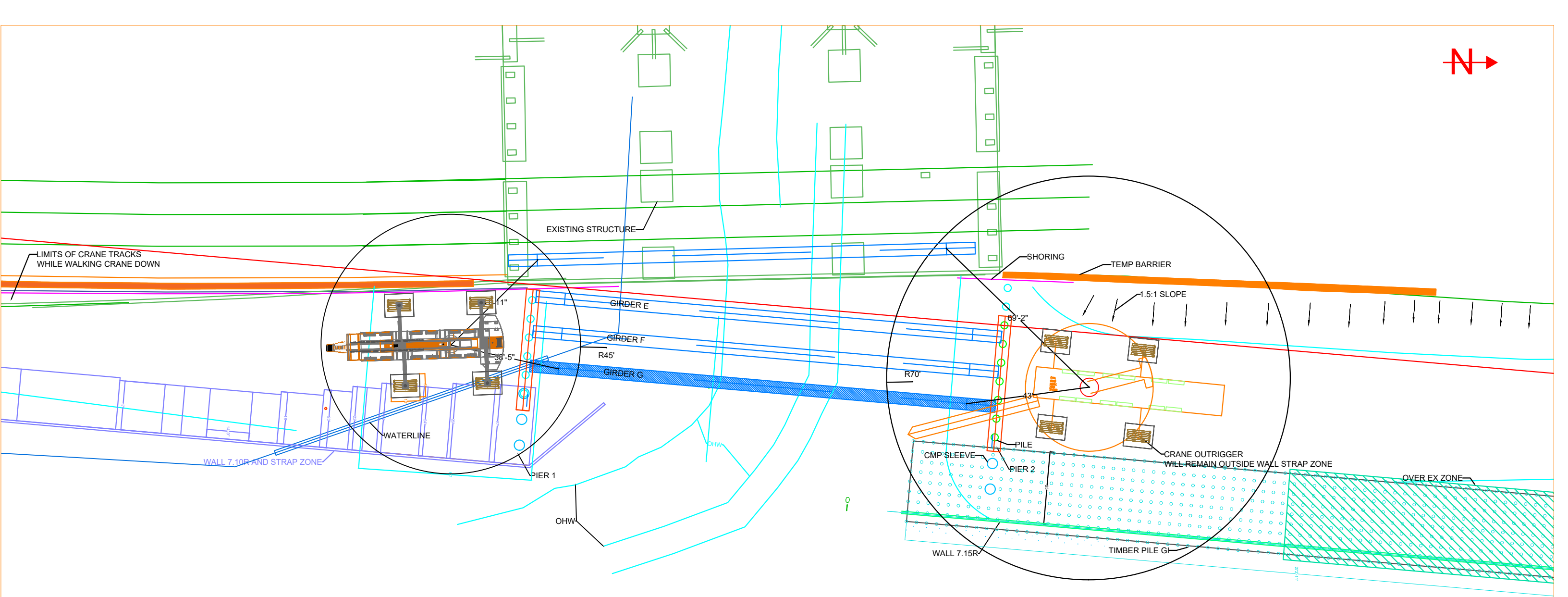
**NOTES:**

1. GIRDER E SHALL BE BRACED AT MIDSPAN TO EXISTING BRIDGE UNTIL ADJACENT GIRDER IS SET AND MIDSPAN X-BRACING IS INSTALLED. SEE SUBMITTAL 361 FOR GIRDER BRACING PLAN

PLAN VIEW  
BR25E - SET GIRDER 'E'



PLAN VIEW  
BR25E - SET GIRDER 'F'

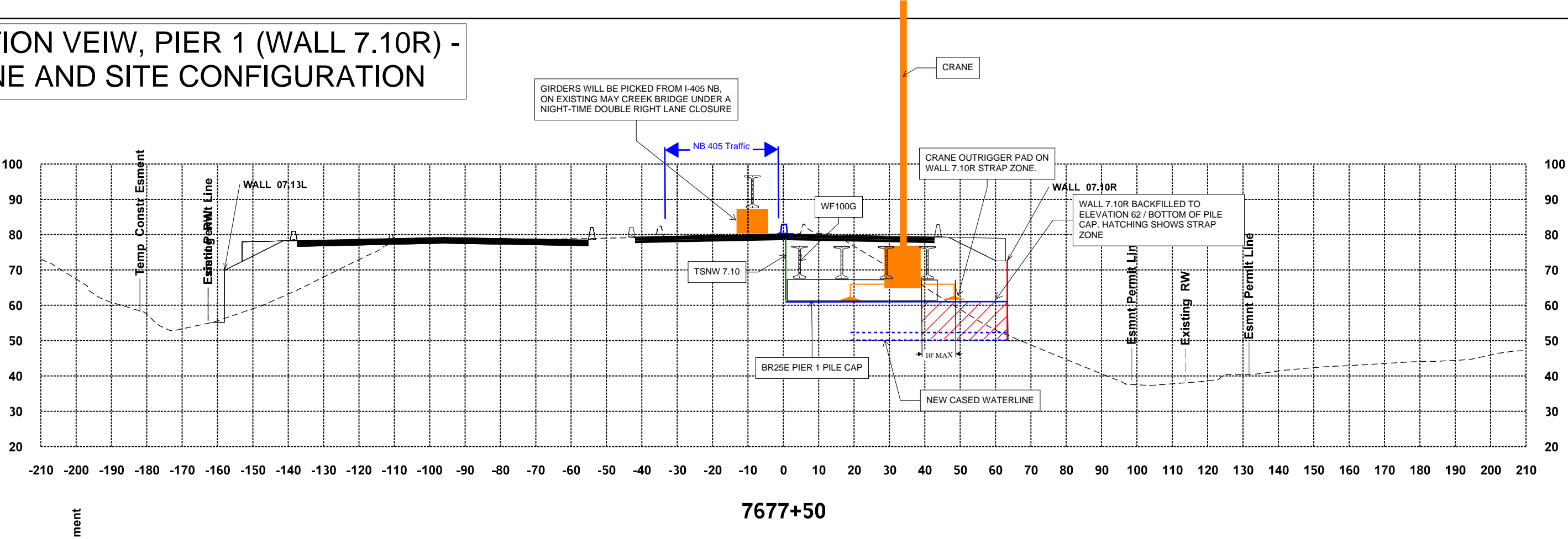


PLAN VIEW  
BR25E - SET GIRDER 'G'






SECTION VEIW, PIER 1 (WALL 7.10R) -  
CRANE AND SITE CONFIGURATION



Crane will sit at the north end of the partially constructed wall. The crane pad/wall backfill will be at elevation 62. The west two crane outriggers will be supported on outrigger pads. The outriggers will located 10ft or less within the strap zone.

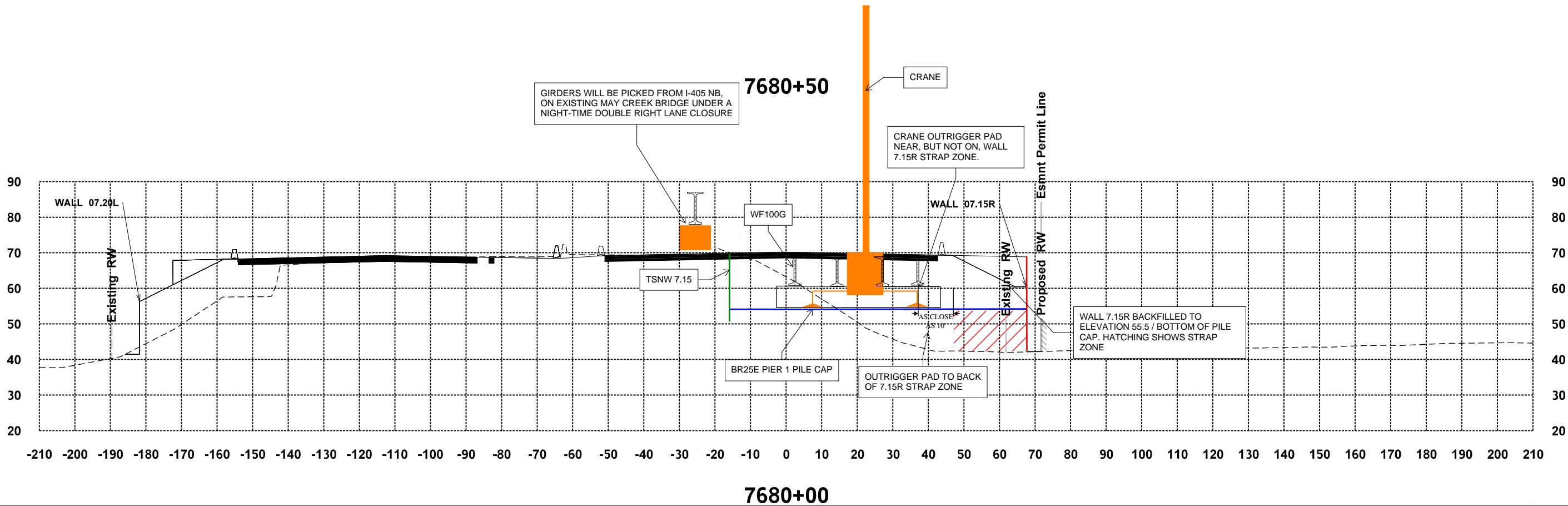
Memo from RECo can be found at the end of this document.

FILE NAME c:\users\steven.omalley\documents\project\wise\working\dlr\wsdot\dms10240\XL5467_XS_RD 1B NB and SB W_Wall Labels.dgn														 <div>Washington State Department of Transportation</div>		I-405; RENTON TO BELLEVUE WIDENING AND EXPRESS TOLL LANES PROJECT			
TIME 1:17:30 PM								REGION NO. STATE		FED.AID PROJ.NO.		PLAN REF NO							
DATE 7/16/2021								10 WASH											
PLOTTED BY steven.omalley										JOB NUMBER									
DESIGNED BY																			
ENTERED BY																			
CHECKED BY																			
PROJ. ENGR.										CONTRACT NO.		LOCATION NO.							
REGIONAL ADM.																			

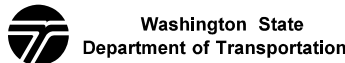
SECTION VEIW, PIER 2 (WALL 7.15R) -  
CRANE AND SITE CONFIGURATION

Crane will sit at the south end of the partially constructed wall.  
The crane pad/wall backfill will be at elevation 55.5. The west  
two crane outriggers will be supported on outrigger pads. The  
outriggers will NOT be within the wall strap zone.

Memo from RECo can be found at the end of this document.



FILE NAME c:\users\steven.omalley\documents\projectwise\working\dr\wsdot\dms10240\XL5467_XS_RD 1B NB and SB W_Wall Labels.dgn				FED.AID PROJ.NO.	
TIME 1:17:40 PM				REGION NO. 10	STATE WASH
DATE 7/16/2021				JOB NUMBER	
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DESIGNED BY				LOCATION NO.	
ENTERED BY					
CHECKED BY					
PROJ. ENGR.					
REGIONAL ADM.	REVISION	DATE	BY		



I-405; RENTON TO BELLEVUE WIDENING  
AND EXPRESS TOLL LANES PROJECT

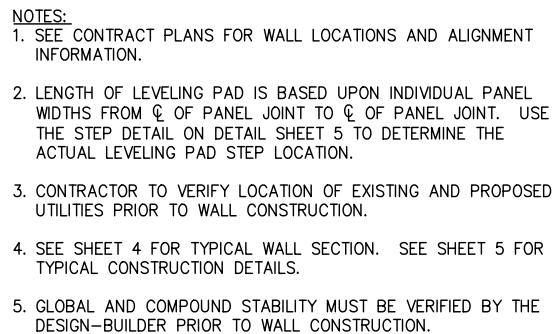
SEG. 1B NB I-405 XS

PLAN REF NO

SHEET  
OF  
SHEETS

PANEL COLUMN NO. (TYP.) → 1

2 BEGIN WALL 07.10R  
STA 0+28.00 =  
NB I-405 STA 7674+38.85  
45.62' RT.



**KEY:**

ART<sub>6</sub><sup>D</sup>

— PANEL TYPE

— REQUIRED NUMBER OF TIE STRIPS

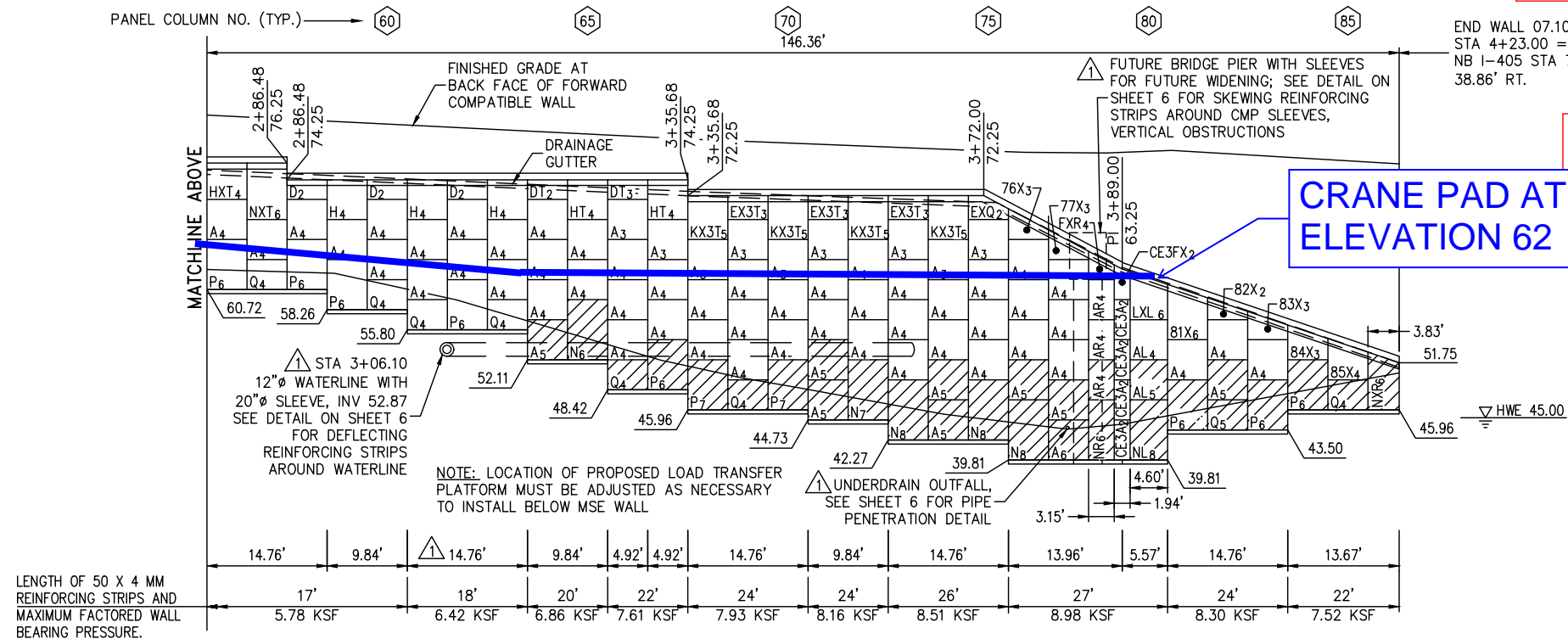
— T = SHIFTED TIE STRIPS

— PANEL ADDITIONS (D) = DOWELS IN PANEL

RED PANEL CUT EDGE \_\_\_\_\_ T = SHIFTED TIE STRIPS  
 RIGHT SIDE CUT  
 LEFT SIDE CUT


 PANEL WITH "R5"  
PANEL REINFORCEMENT


 PANEL WITH "R7"  
PANEL REINFORCEMENT



CRANE PAD AT  
ELEVATION 62

<b>DOCUMENT REVIEW</b>	
<input type="checkbox"/>	APPROVED, NO EXCEPTION TAKEN
<input checked="" type="checkbox"/>	APPROVED AS NOTED
<input type="checkbox"/>	RESUBMIT, REVISE AS NOTED
<input type="checkbox"/>	REVIEWED COMMENTS PROVIDED IF ANY
DESIGNED BY: <u>J. Broadus</u>	DATE: <u>6-18-21</u>

for general conformance with contract or design documents. Solely for correctness of dimensions, details, quantities, materials, and safety during fabrication and erection shall remain with the contractor.

CERTIFIED WITH RESPECT TO INTERNAL STABILITY OF  
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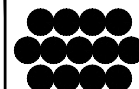


5/26/2021

SCALE : 1" = 20'




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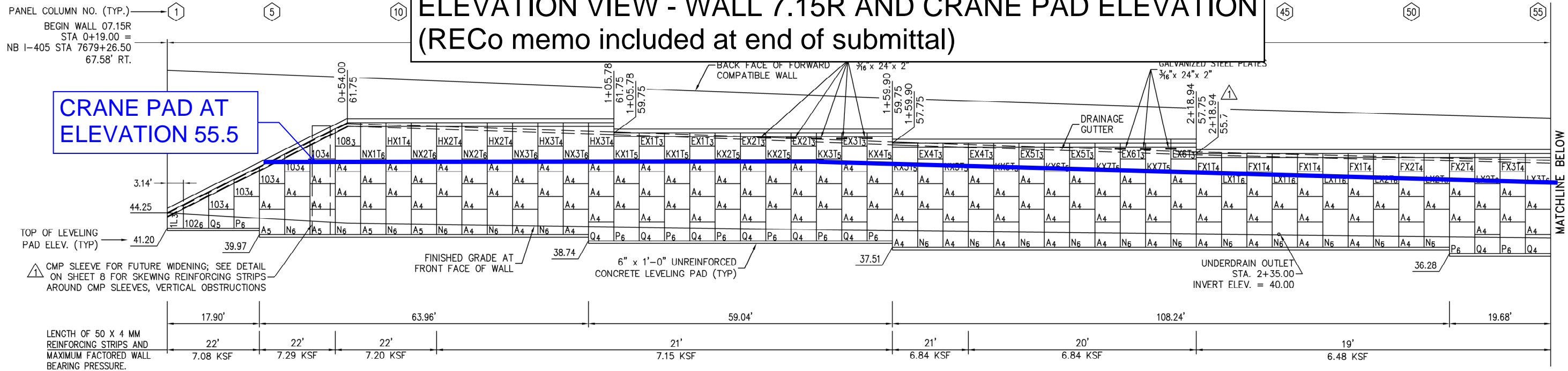
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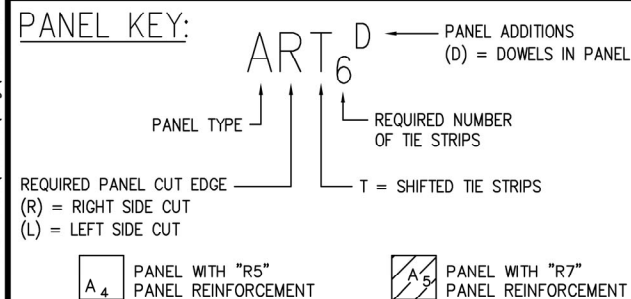
DESIGNED BY: BLN		5/26/2021	PER REVISED STORM DRAIN PROTECTION DETAIL	PROJECT NAME	I-405: RENTON TO BELLEVUE WIDENING AND EXPRESS TOLL LANES PROJECT	DATE: 12/22/2020
PROJECT ENGR: BLN		3/8/2021	PER FLJV RFI #205	LOCATION	RENTON TO BELLEVUE, WASHINGTON	CONTRACT No: RE-20024
CHECKED BY: JRS		3/3/2021	PER REVIEW COMMENTS	OWNER	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION	DRAWING No: 3 OF 7
ENGR MANAGER: JRS	REV.	DATE	DESCRIPTION	DRAWING COVERS	ELEVATION - WALL 07.10R	SCALE: AS SHOWN



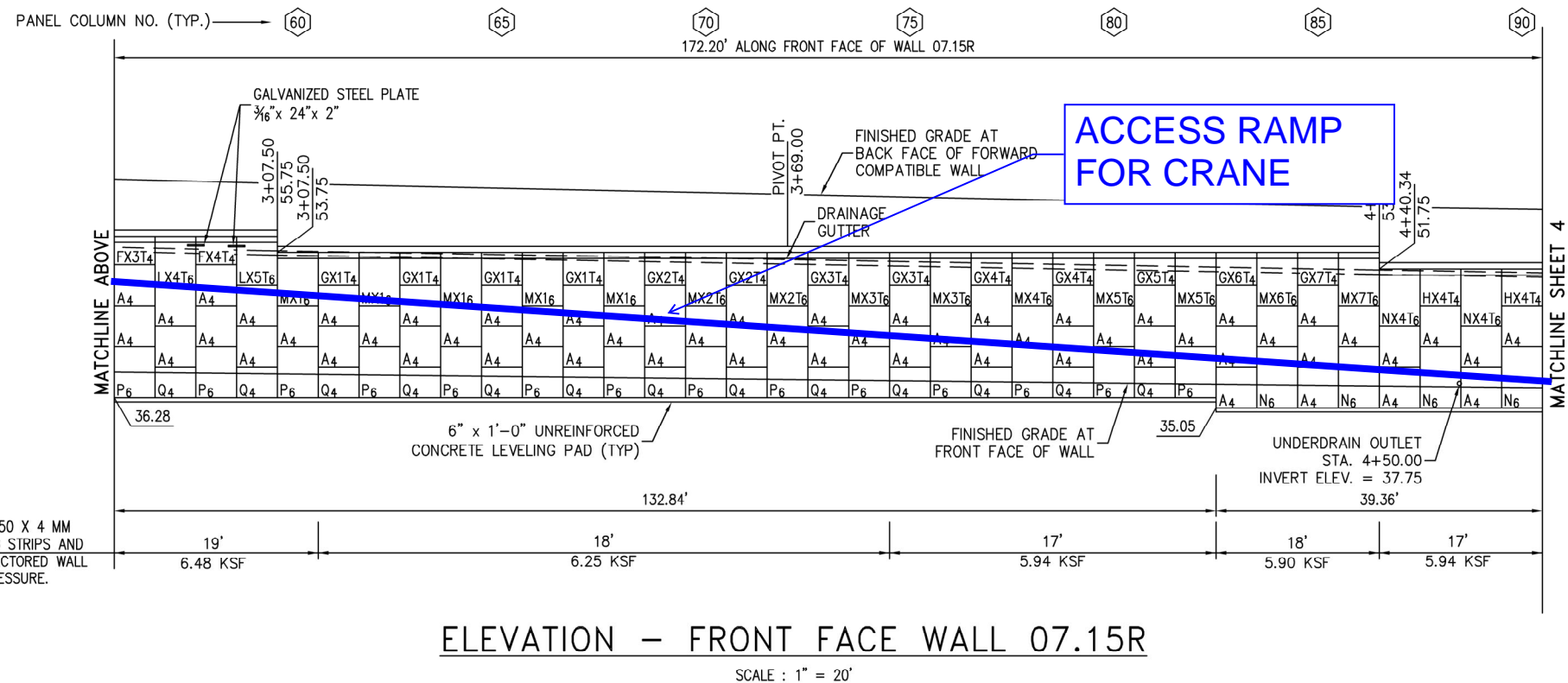
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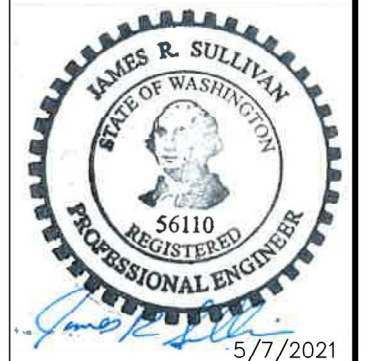
- NOTES:
- SEE CONTRACT PLANS FOR WALL LOCATIONS AND ALIGNMENT INFORMATION.
  - LENGTH OF LEVELING PAD IS BASED UPON INDIVIDUAL PANEL WIDTHS FROM C OF PANEL JOINT TO C OF PANEL JOINT. USE THE STEP DETAIL ON DETAIL SHEET 7 TO DETERMINE THE ACTUAL LEVELING PAD STEP LOCATION.
  - CONTRACTOR TO VERIFY LOCATION OF EXISTING AND PROPOSED UTILITIES PRIOR TO WALL CONSTRUCTION.
  - SEE SHEET 6 FOR TYPICAL WALL SECTION. SEE SHEET 7 FOR TYPICAL CONSTRUCTION DETAILS.
  - GLOBAL AND COMPOUND STABILITY MUST BE VERIFIED BY THE DESIGN-BUILDER PRIOR TO WALL CONSTRUCTION.



LENGTH OF 50 X 4 MM REINFORCING STRIPS AND MAXIMUM FACTORED WALL BEARING PRESSURE.



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DESIGNED BY: DBH				PROJECT NAME	I-405: RENTON TO BELLEVUE WIDENING AND EXPRESS TOLL LANES PROJECT	DATE: 1/8/2021
PROJECT ENGR: BLN				LOCATION	RENTON TO BELLEVUE, WASHINGTON	CONTRACT No: RE-20024
CHECKED BY: JRS	△	3/3/2021	PER WSDOT REVIEW COMMENTS	OWNER	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION	DRAWING No: 3 OF 9
ENGR MANAGER: JRS	REV.	DATE	DESCRIPTION	DRAWING COVERS	ELEVATION - WALL 07.15R	SCALE: AS SHOWN

# CRITICAL LIFT PLAN - TANDEM LIFT




Flatiron Construction Corp.  
385 Interlocken Crescent  
Broomfield, CO 80021  
303 485 4050 MAIN  
303 776 0072 FAX  
[www.flatironcorp.com](http://www.flatironcorp.com)

## TECHNICAL MEMORANDUM

Project: **I-405 R2B**

Date: 12/20/2021

From: Edmundo Salgado 

To: Evan Estelle

cc: Ilima Alexander

Subject: **May Creek (Phase 1) - Girder Set (Tandem Lift)**

---

This office has received and reviewed the materials provided for the erection of precast girders of the May Creek (Phase 1) Bridge on the I-405 R2B project. The following documents were provided as the lift plan.

- 1) BR25E – May Creek – Phase 1 – Girder Erection Plan 2021.12.09
- 2) Critical Lift BR25E, Phase 1, Girder Set 300TON
- 3) Critical Lift BR25E, Phase 1, Girder Set 550TON

This office takes no exceptions to the lift plan and the girder erection can proceed as shown as long as the following is confirmed.

- 1) The number of parts required for the main hoist line during lift.

**APPENDIX A      FLATIRON CALCULATIONS**  
8 pages



## CRITICAL LIFT WORKSHEETS

I-405 R2B

Tandem Pick for May Creek

2 CRANE LIFT

Crane 1: Grove GMK6300B (300 Ton)

SERIAL No. 6250-8007

72 FT BOOM

43.83 FT RADIUS





# CRITICAL LIFT WORKSHEET

Excel Version 01 DEC 2020

Project: I-405 R2B  
 Prepared by: Jay-R Salgado  
 Date: 20 Dec 2021  
 Reviewed by:

Qualified Level 3 Lift Planner Statement:

**I have reviewed the information in this package and found it complete and accurate**

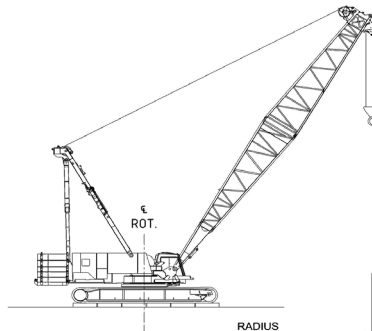
Date: Signature:

## GENERAL LIFT INFORMATION:

1) Description of lift: Tandem Pick for May Creek  
 2) Date:  
 3) Crane: Grove GMK6300B (300 Ton)  
 4) Serial #: 6250-8007  
 5) Boom length: 72.0 ft Jib ft  
 6) Multiple crane lift? YES No. of cranes: 2 Crane: 1

7) Included attachments:

- ☐ Hoisted weight, wind load, rigging sketch & setup requirements sheets
- ☐ Vertical clearance check
- ☐ Horizontal clearance check
- ☐ Crane chart with serial number
- ☐ Lift layout / planview
- ☐ Lifting device design and 125% proof test on file
- ☐ Hoisted weight determination
- ☐
- ☐
- ☐



## HOISTED WEIGHT:

8) Hoisted item: 107,024 lbs  
 9) Rigging: 408 lbs  
 10) Headache ball: lbs  
 11) Load Block: 2,500 lbs  
 12) Wire rope: H: 5 W: parts: 2,389 lbs  
 13) Boom Tip Attachments: lbs  
 14) Total: **112,321** lbs

## CAPACITY:

15) Title of chart used: Chart w/Lift Plan  
 16) Boom / swing restrictions: None  
 17) Maximum radius to be used: 44 ft  
 18) Minimum boom angle: deg  
 19) Chart capacity @ 45 ft: 142,000 lbs  
 20) Wind load derate: -955 lbs  
 21) Adjusted capacity: **141,045** lbs  
 22) Percent of adjusted capacity: **79.6** %

## SET-UP REQUIREMENTS:

23) Distance to powerlines: ft  
 24) Ground conditions:  
 25) Levelness: deg  
 26) Wind conditions: Max 15 mph  
 27) Site conditions:

## REMARKS:

See Ground analysis from RECo

This Sheet to be Completed by a Qualified Lift Planner.

Complete Two Work Sheets for Tandem Lifts



# HOISTED WEIGHT WORKSHEET

Excel Version 01 DEC 2020

## GENERAL LIFT INFORMATION:

Project: I-405 R2B  
 Prepared by: JSA Date: 20 Dec 2021  
 Reviewed by: Date:

1) Description of lift Tandem Pick for May Creek  
 2) Date  
 3) Crane Grove GMK6300B (300 Ton)

8) HOISTED ITEM: May Creek Girder

Weight: 107,024 lb

How was the weight of the hoisted item determined:

Shop Drawings

Checked by:

Hoisted item is stable during all stages of the lift:

YES

Checked by:

Date:

Stresses in hoisted item are within acceptable limits:

YES

Checked by:

Date:

## 9) RIGGING:

Item	WLL (lbs)	Load in Item (lbs)	✓	Length	Weight/EA	Qty.	Total Weight
1 Sling	180,000	107,492	OK	30 ft	120 lb	1 ea	120 lb
2 55T Shackle	110,000	107,406	OK	ft	86 lb	1 ea	86 lb
3 Lifting Assem.	110,000	107,024	OK	ft	202 lb	1 ea	202 lb
4				ft	lb	ea	lb
5				ft	lb	ea	lb
6				ft	lb	ea	lb
7				ft	lb	ea	lb

\* Working Load Limit

Lift

Rigging Total Weight: 408 lb

10) HEADACHE BALL: Serial#: Capacity: NO Capacity greater than 8+9?: N/A Weight: lb

11) LOAD BLOCK: Serial#: Capacity: 175,000 YES Capacity greater than 8+9?: YES Weight: 2,500 lb

## 12) WIRE ROPE:

Whip Rope Type:	Dia.: in	Hoist Rope Type:	Dia.: 1.000 in
a) Drum Pull Capacity: lb	b) WLL: lb	a) Drum Pull Capacity: 24,700 lb	b) WLL: 25,363 lb
c) Required # Parts: ea (8 + 9 + 10)/min(a or b)		c) Required # Parts: 5 ea (8 + 9 + 11)/min(a or b)	
d) Actual # Parts: ea		d) Actual # Parts: 5 ea	
e) Length: ft	f) Weight: lb/ft	e) Length: 250 ft	f) Weight: 1.91 lb/ft
Whip Rope Weight: lb $d \times e \times f$		Hoist Rope Weight: 2,389 lb $d \times e \times f$	

Total Wire Rope Weight: 2,389 lb

13) BOOM TIP ATTACHMENTS: Stowed? Weight: lb

This Sheet to be Completed by a Qualified Lift Planner.

Complete Two Work Sheets for Tandem Lifts



# WIND LOAD WORKSHEET

Excel Version 01 DEC 2020

Project: I-405 R2B  
 Prepared by: JSA Date: 20 Dec 2021  
 Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

## GENERAL LIFT INFORMATION:

1) Description of lift Tandem Pick for May Creek  
 2) Date \_\_\_\_\_  
 3) Crane Grove GMK6300B (300 Ton)

## 20) WIND LOAD DERATE FOR MOBILE CRANES:

### A) Required information:

Proposed maximum 3 second average wind speed:

Wind exposure area of hoisted item:

Crane chart capacity:

Load force coefficient of hoisted item:

Elevation of load above anemometer:

Velocity increase factor  $I = 0.48 * H^{0.22}$

$v =$  15 mph  
 $A =$  676 ft<sup>2</sup>  
 $C_{crane} =$  142,000 lbs  
 $C_f =$  1.8 (use 1.0 for pipe, 1.7 for girder, 1.8 for boxes and plates)  
 $H =$  \_\_\_\_\_ If (if  $H > 30$  ft, calculate velocity increase factor "I")  
 $=$  1.00 (I = 1.0 if  $H \leq 30$  ft)

Boom Type:

Telescopic

Radius:  $R =$  44 ft

Boom length:  $L =$  72 ft

Boom depth:  $b =$  \_\_\_\_\_ ft

### B) Check boom strength (side load by wind on hoisted load):

if  $v < 20$ , wind load on item:  $F_w = \frac{(I * v)^2}{400} \times A \times C_f =$  684 lbs

Wind load / crane chart capacity:  $F_w / C_{crane} =$  0.48%

if  $< 1\%$ , no derate, if between 1% and 2%, derate = 10% (over 2% is not allowed)

Derate for side wind load: <1% No derate lbs

### C) Calculate wind derate for wind directly to or away from the crane and hoisted load:

load on hoisted item:  $D_{tip} = F_w \sqrt{\left(\frac{L}{R}\right)^2 - 1} =$  892 lbs

load on lattice boom:  $D_{boom} = \frac{(I * v)^2}{1200} \times b \times \frac{(L^2 - R^2)}{R} =$  \_\_\_\_\_ lbs

load on telescopic boom:  $D_{boom} = \frac{3 \times (I * v)^2}{800} \times \frac{(L^2 - R^2)}{R} =$  63 lbs

Derate for front / rear wind load:  $D_{tip} + D_{boom} =$  955 lbs

**Transfer the greater of the side load and rear/front wind load derates to line 21 of the Critical Pick Worksheet**

### D) Obtain specific written authorization from level 3 engineer to pick in winds over 20 mph.

### E) Confirm manufacturers' recommended derate and operation restrictions for proposed wind speed

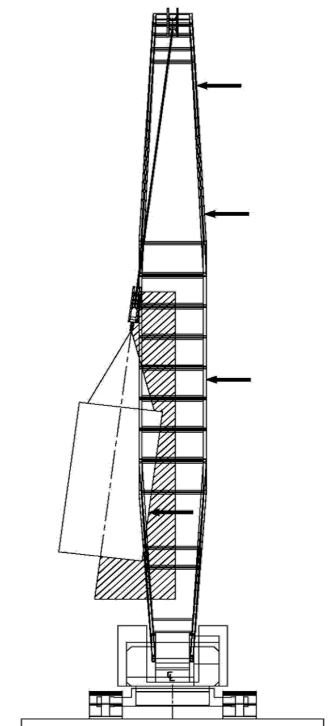
If recommendations exceed derates in this sheet, manufacturers recommendations govern

### F) Confirm that wind force doesn't cause the load to contact any part of the crane

## 26) WIND CONDITIONS

Transfer the confirmed max 3 second average wind speed to line 26 of the Critical Pick Sheet

**This Sheet to be Completed by a Qualified Lift Planner.**



**Complete Two Work Sheets for Tandem Lifts**



## CRITICAL LIFT WORKSHEETS

I-405 R2B

Tandem Pick for May Creek

2 CRANE LIFT

Crane 2: Grove GMK7550 (550 Ton)

SERIAL No. 7450-8003

115.9 FT BOOM

43.83 FT RADIUS



## CRITICAL LIFT WORKSHEET

Excel Version 01 DEC 2020

Project: I-405 R2B  
Prepared by: Jay-R Salgado  
Date: 20 Dec 2021  
Reviewed by:

Qualified Level 3 Lift Planner Statement:

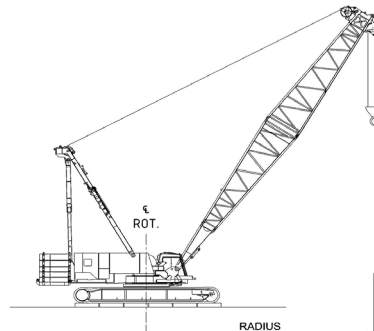
**I have reviewed the information in this package and found it complete and accurate**

Date: Signature:

### GENERAL LIFT INFORMATION:

1) Description of lift: Tandem Pick for May Creek  
2) Date:  
3) Crane: Grove GMK7550 (550 Ton)  
4) Serial #: 7450-8003  
5) Boom length: 115.9 ft Jib ft  
6) Multiple crane lift? YES No. of cranes: 2 Crane: 2  
7) Included attachments:

- ☒ Hoisted weight, wind load, rigging sketch & setup requirements sheets
- ☒ Vertical clearance check
- ☒ Horizontal clearance check
- ☐ Crane chart with serial number
- ☒ Lift layout / planview
- ☐ Lifting device design and 125% proof test on file
- ☒ Hoisted weight determination



This Sheet to be Completed by a Qualified Lift Planner.

### HOISTED WEIGHT:

8) Hoisted item: 107,024 lbs  
9) Rigging: 408 lbs  
10) Headache ball: lbs  
11) Load Block: 3,758 lbs  
12) Wire rope: H: 5 W: parts: 4,940 lbs  
13) Boom Tip Attachments: lbs  
14) Total: **116,130** lbs

### CAPACITY:

15) Title of chart used: Chart w/Lift Plan  
16) Boom / swing restrictions: None  
17) Maximum radius to be used: 44 ft  
18) Minimum boom angle: deg  
19) Chart capacity @ 70 ft: 127,000 lbs  
20) Wind load derate: -1,897 lbs  
21) Adjusted capacity: **125,103** lbs  
22) Percent of adjusted capacity: **92.8** %

### SET-UP REQUIREMENTS:

23) Distance to powerlines: ft  
24) Ground conditions:  
25) Levelness: deg  
26) Wind conditions: Max 15 mph  
27) Site conditions:

### REMARKS:

See Ground analysis from RECo

Complete Two Work Sheets for Tandem Lifts



# HOISTED WEIGHT WORKSHEET

Excel Version 01 DEC 2020

## GENERAL LIFT INFORMATION:

Project: I-405 R2B  
 Prepared by: JSA Date: 20 Dec 2021  
 Reviewed by: Date:

1) Description of lift Tandem Pick for May Creek  
 2) Date  
 3) Crane Grove GMK7550 (550 Ton)

8) HOISTED ITEM: May Creek Girder

Weight: 107,024 lb

How was the weight of the hoisted item determined:

Shop Drawings

Checked by:

Hoisted item is stable during all stages of the lift:

YES

Checked by:

Date:

Stresses in hoisted item are within acceptable limits:

YES

Checked by:

Date:

## 9) RIGGING:

Item	WLL (lbs)	Load in Item (lbs)	✓	Length	Weight/EA	Qty.	Total Weight
1 Sling	180,000	104,088	OK	30 ft	120 lb	1 ea	120 lb
2 55T Shackle	110,000	104,002	OK	ft	86 lb	1 ea	86 lb
3 Lifting Assem.	110,000	103,800	OK	ft	202 lb	1 ea	202 lb
4				ft	lb	ea	lb
5				ft	lb	ea	lb
6				ft	lb	ea	lb
7				ft	lb	ea	lb

\* Working Load Limit

Lift

Rigging Total Weight: 408 lb

10) HEADACHE BALL: Serial#: Capacity: NO Capacity greater than 8+9?: N/A Weight: lb

11) LOAD BLOCK: Serial#: Capacity: 250,000 YES Capacity greater than 8+9?: YES Weight: 3,758 lb

## 12) WIRE ROPE:

Whip Rope Type:	Dia.: in	Hoist Rope Type:	Dia.: 1.000 in
a) Drum Pull Capacity: lb	b) WLL: lb	a) Drum Pull Capacity: 24,700 lb	b) WLL: 25,363 lb
c) Required # Parts: ea (8 + 9 + 10)/min(a or b)		c) Required # Parts: 5 ea (8 + 9 + 11)/min(a or b)	
d) Actual # Parts: ea		d) Actual # Parts: 5 ea	
e) Length: ft	f) Weight: lb/ft	e) Length: 500 ft	f) Weight: 1.98 lb/ft
Whip Rope Weight: lb $d \times e \times f$		Hoist Rope Weight: 4,940 lb $d \times e \times f$	

Total Wire Rope Weight: 4,940 lb

13) BOOM TIP ATTACHMENTS: Stowed? Weight: lb

This Sheet to be Completed by a Qualified Lift Planner.

Complete Two Work Sheets for Tandem Lifts



# WIND LOAD WORKSHEET

Excel Version 01 DEC 2020

Project: I-405 R2B  
 Prepared by: JSA Date: 20 Dec 2021  
 Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

## GENERAL LIFT INFORMATION:

1) Description of lift Tandem Pick for May Creek  
 2) Date \_\_\_\_\_  
 3) Crane Grove GMK7550 (550 Ton)

## 20) WIND LOAD DERATE FOR MOBILE CRANES:

### A) Required information:

Proposed maximum 3 second average wind speed:

Wind exposure area of hoisted item:

Crane chart capacity:

Load force coefficient of hoisted item:

Elevation of load above anemometer:

Velocity increase factor  $I = 0.48 * H^{0.22}$

$v =$  15 mph  
 $A =$  676 ft<sup>2</sup>  
 $C_{crane} =$  127,000 lbs  
 $C_f =$  1.8 (use 1.0 for pipe, 1.7 for girder, 1.8 for boxes and plates)  
 $H =$  \_\_\_\_\_ If (if  $H > 30$  ft, calculate velocity increase factor "I")  
 $=$  1.00 (I = 1.0 if  $H \leq 30$  ft)

Boom Type:

Telescopic

Radius:  $R =$  44 ft

Boom length:  $L =$  116 ft

Boom depth:  $b =$  \_\_\_\_\_ ft

### B) Check boom strength (side load by wind on hoisted load):

if  $v < 20$ , wind load on item:  $F_w = \frac{(I * v)^2}{400} \times A \times C_f =$  684 lbs

Wind load / crane chart capacity:  $F_w / C_{crane} =$  0.54%

if  $< 1\%$ , no derate, if between 1% and 2%, derate = 10% (over 2% is not allowed)

Derate for side wind load: <1% No derate lbs

### C) Calculate wind derate for wind directly to or away from the crane and hoisted load:

load on hoisted item:  $D_{tip} = F_w \sqrt{\left(\frac{L}{R}\right)^2 - 1} =$  1,675 lbs

load on lattice boom:  $D_{boom} = \frac{(I * v)^2}{1200} \times b \times \frac{(L^2 - R^2)}{R} =$  \_\_\_\_\_ lbs

load on telescopic boom:  $D_{boom} = \frac{3 \times (I * v)^2}{800} \times \frac{(L^2 - R^2)}{R} =$  222 lbs

Derate for front / rear wind load:  $D_{tip} + D_{boom} =$  1,897 lbs

**Transfer the greater of the side load and rear/front wind load derates to line 21 of the Critical Pick Worksheet**

### D) Obtain specific written authorization from level 3 engineer to pick in winds over 20 mph.

### E) Confirm manufacturers' recommended derate and operation restrictions for proposed wind speed

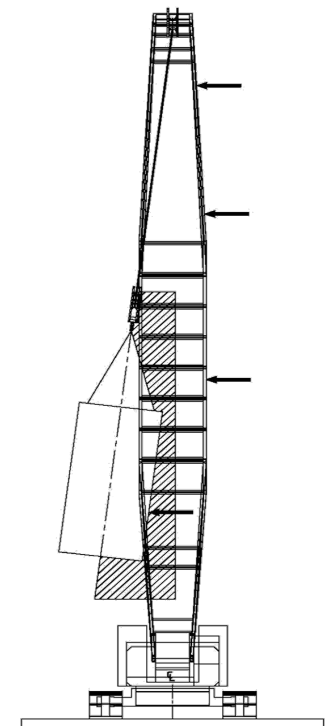
If recommendations exceed derates in this sheet, manufacturers recommendations govern

### F) Confirm that wind force doesn't cause the load to contact any part of the crane

## 26) WIND CONDITIONS

Transfer the confirmed max 3 second average wind speed to line 26 of the Critical Pick Sheet

**This Sheet to be Completed by a Qualified Lift Planner.**



**Complete Two Work Sheets for Tandem Lifts**

**APPENDIX B      DESIGN DOCUMENTS**

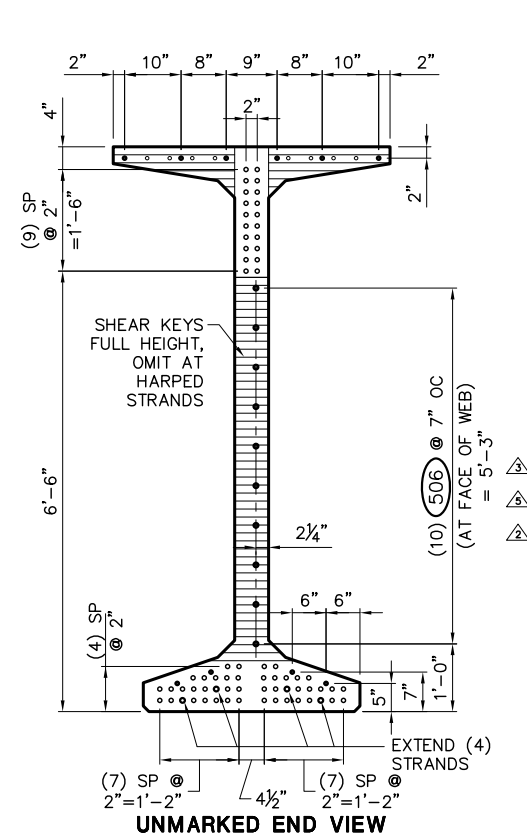
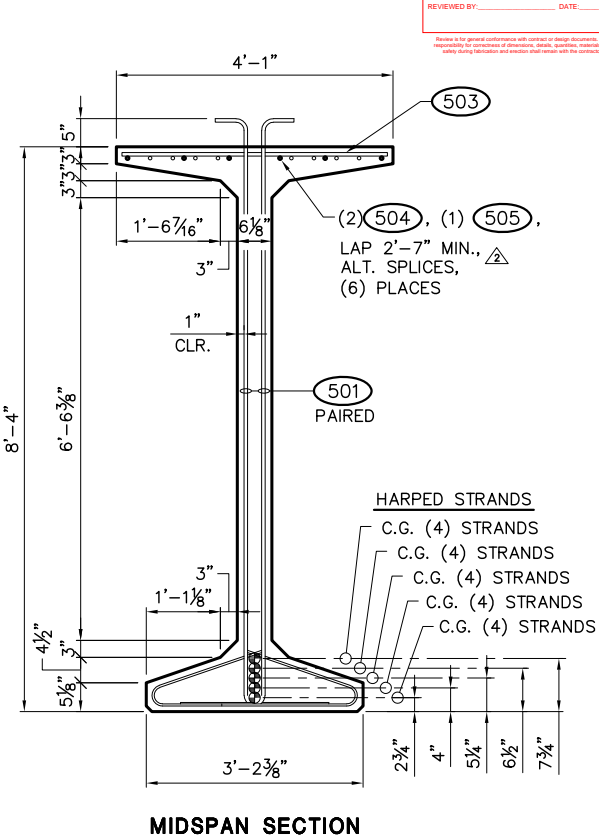
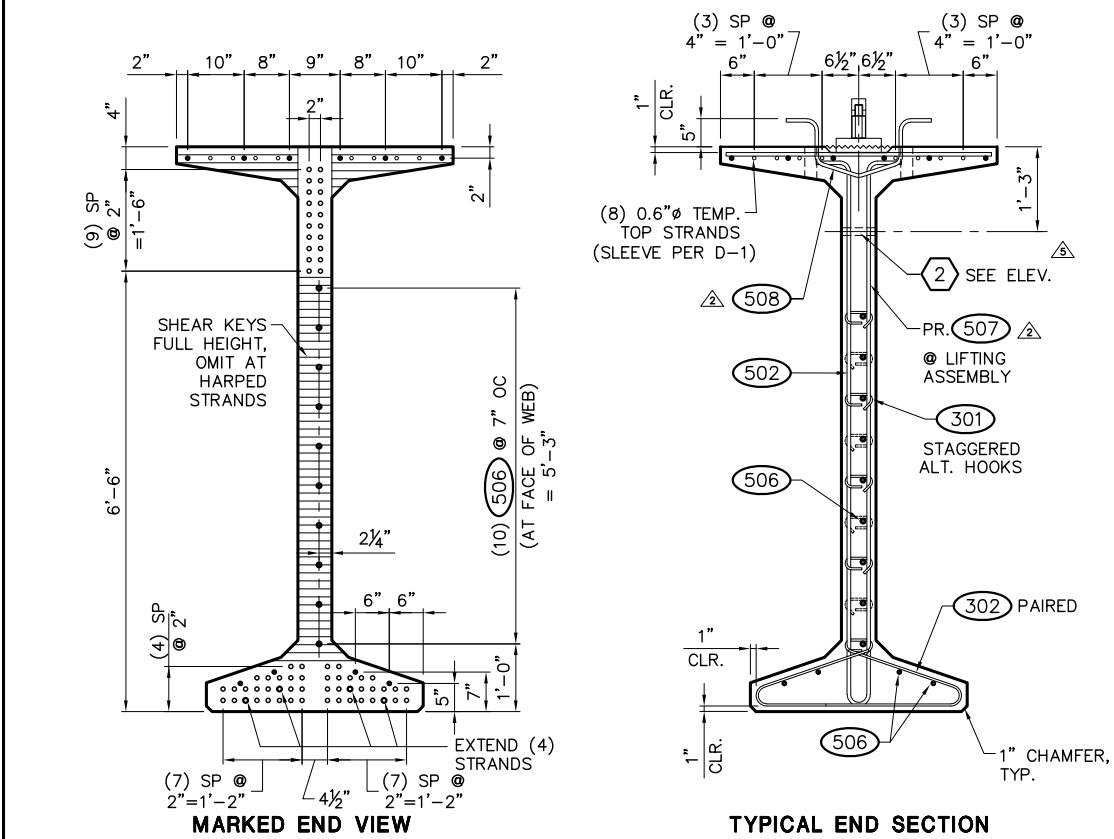
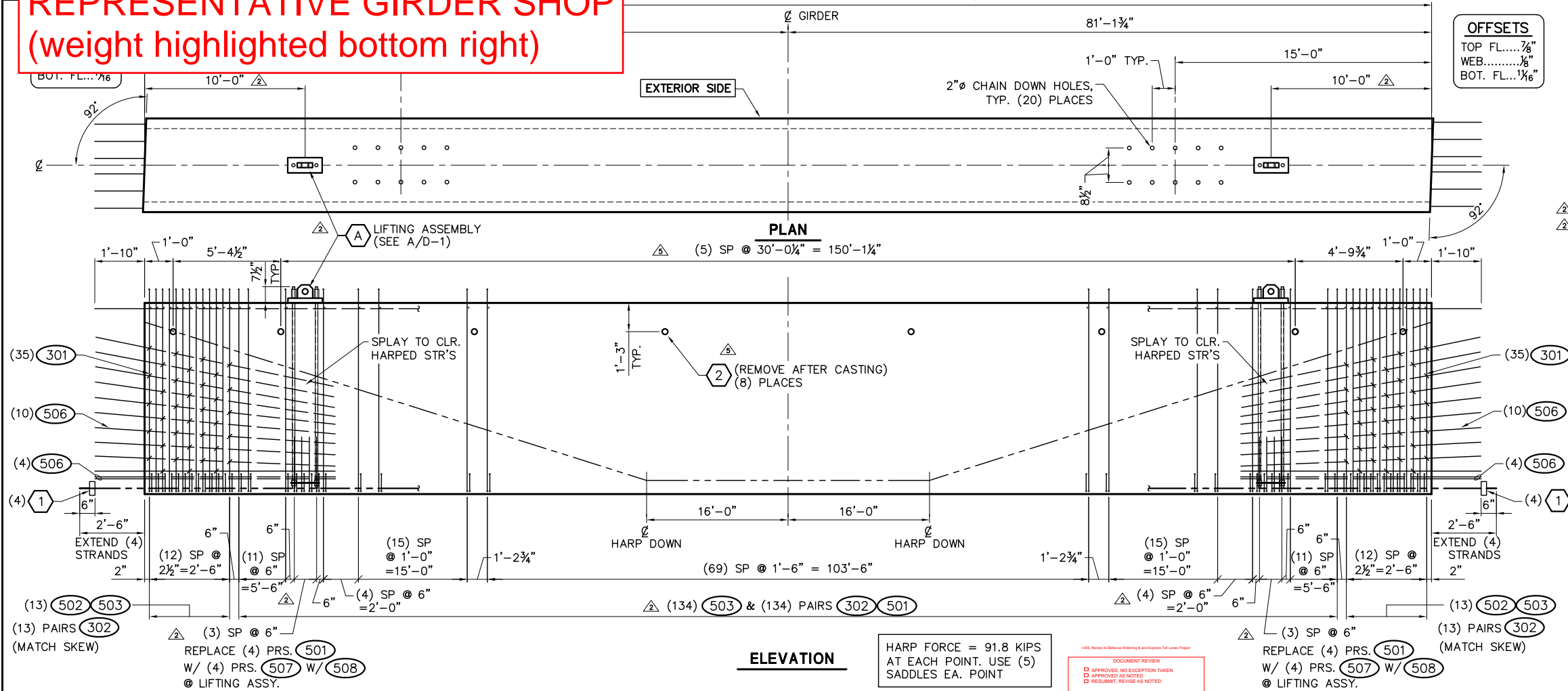
0 pages



## REPRESENTATIVE GIRDER SHOP

(weight highlighted bottom right)

RING LENGTH = **162'-3½"** (2⅝" ADDED FOR SHORTENING)

**REINFORCEMENT SCHEDULE** – DOMESTIC (U.N.O.)[illegible]

NOTE: COAT TOP 6" OF

501 502

508

WITH W.S.D.O.T. STD PAINT

I-405, Renton to Bellevue Widening & Express Toll Lanes Project

DOCUMENT REVIEW

☒ APPROVED, NO EXCEPTION TAKEN  
☐ APPROVED AS NOTED  
☐ RESUBMIT, REVISE AS NOTED  
☐ REVIEWED COMMENTS PROVIDED IF ANY

REVIEWED BY: JDW DATE 11/30/2011

SHEAR KEY TOOTH DETAIL

## GENERAL NOTES

**CONCRETE:** STRENGTH @ RELEASE.... 7,500 P.S.I.  
STRENGTH @ 28 DAYS.... 9,000 P.S.I.

**PRESTRESS:** 0.6"Ø 270KSI, 7 WIRE UNCOATED  
LOW RELAXATION STRAND ← **DOMESTIC**

HARPED: (20) STRANDS JACKED TO 878.0 KIPS (43.9 K/STR.)  
STRAIGHT: (46) STRANDS JACKED TO 2,019.4 KIPS (43.9 K/STR.)  
TEMPORARY: (8) STRANDS JACKED TO 351.2 KIPS (43.9 K/STR.)

**FINISHES:** TOP..... WSDOT STANDARD RAKE  
SIDES.... SACK BOTH SIDES  
SOFFIT... PATCH HARP DOWN & SPALLS  
ENDS..... FORM FINISH, BURN STRANDS FLUSH & EPOXY, EXCEPT AS NOTED.  
PAINT ALL PROJECTING BARS & STRANDS WITH WSDOT PAINT.

**FORM HANGER HOLES:** SEE DWG. P-1  
**YARD HAULING:** 15'-0" FROM EACH END  
**STORAGE BUNKING:** 3'-0" FROM EACH END  
**SHIPPING BUNKING:** 15'-0" FROM EACH END

WSDOT STAMP REQ'D

### INSERT & ASSEMBLY SCHEDULE

[illegible]

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5	REV. FOR CONST.	BRACING HOLES	PDT	GS	11/17/20	<b>CONTRACTOR :</b> (425) 420-9982  <b>FLATIRON</b> 1400 TALBOT RD. S., SUITE 500 RENTON, WA 98055
4	REV. FOR CONST.	REMOVE HANGER	PDT	GS	11/4/20	
3	REV. FOR CONST.	HANGER LOCATION	PDT	GS	10/19/20	
2	REV. FOR CONST.	ADD D/YWIDAG LIFTING ASSEMBLY	PDT	GS	9/1/20	
No.	Status	Revision	By	App'd	Date	

Design . . . . .  
 Drawn . . . . .PDT  
 Checked . . . . .GS  
 Approved . . . . .

**DO NOT  
SCALE**

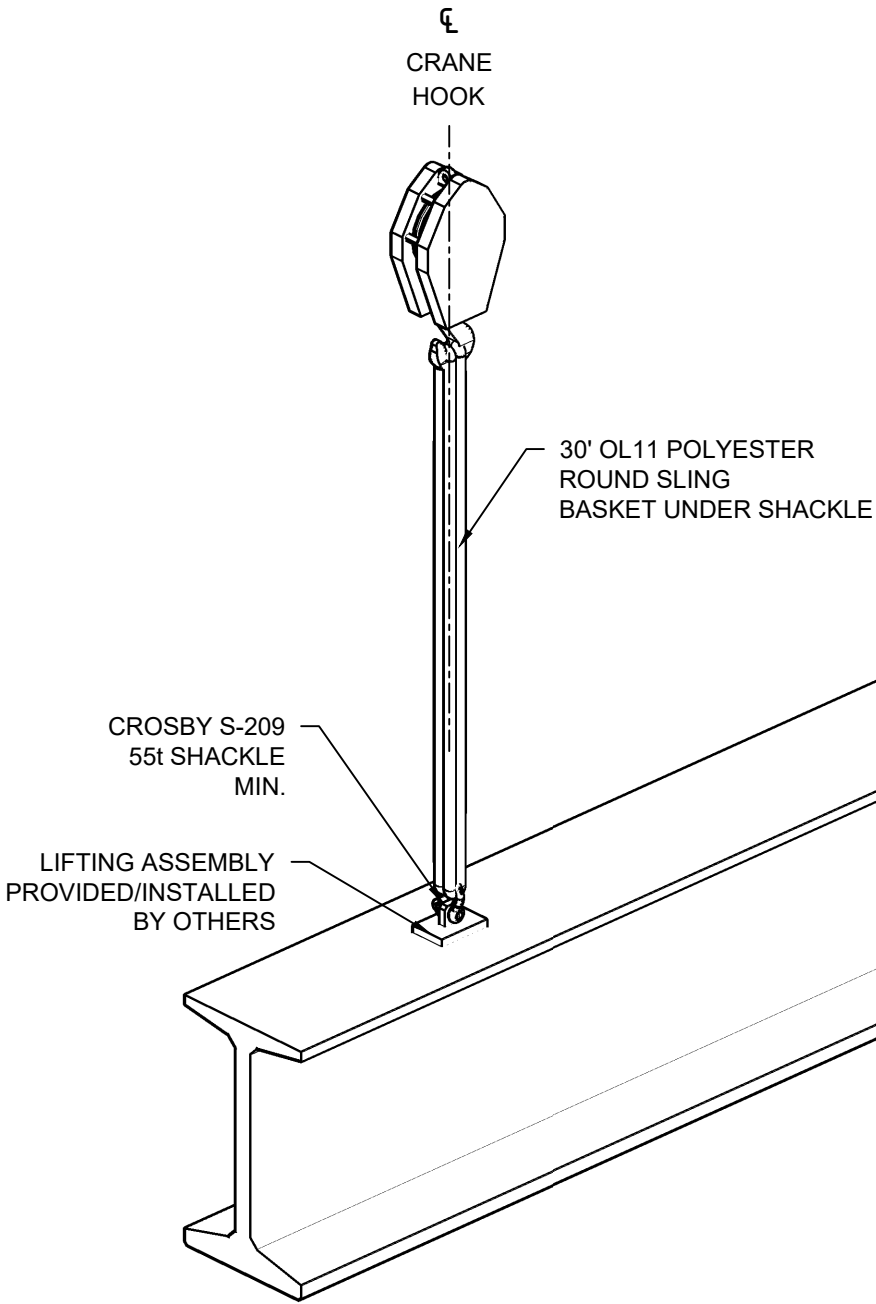
**CONCRETE TECHNOLOGY CORP.**  
MANUFACTURERS OF PRESTRESSED CONCRETE  
1123 PORT OF TACOMA ROAD  
TACOMA, WASHINGTON 98421

**I-405 RENTON TO BELLEVUE WIDENING  
AND EXPRESS TOLL LANES PROJECT**  
1-405 NB OVER MAY CREEK  
KING COUNTY, WASHINGTON

<b>PRODUCTION DRAWING</b>		Date	JUNE 2020
<b>WF100G GIRDER</b>	NOM. WT. = 127.6 K/LF	Sh. No.	of 
<b>MARK: G1</b>	<b>QTY. 1</b>	<b>WT. 207.6 KIPS</b>	<b>G1</b>
		<b>19158L</b>	

RIGGING WEIGHTS			
COMPONENT	QTY	WEIGHT	TOTAL WEIGHT
30' OL11 POLY ROUND SLING	1	4.00#/FT	120.0
CROSBY S-209 55t SHACKLE	1	85.8#/EA	85.8
LIFTING ASSEMBLY	1	130.0#/EA	130.0
TOTAL			336

RIGGING DETAIL



RIGGING DETAILS

GENERAL NOTES:		REV #	REVISIONS	DATE	REV BY	CHK BY	 <p>OFFICES: SEATTLE DIVISION - 1821 180TH ST S.E. BOTHELL, WA 98031 (206) 784-1054 PORTLAND DIVISION - 5730 NE 138TH AVE PORTLAND, OR 97320 (503)-283-3111</p> <p>DISCLOSURE: THIS DOCUMENT IS THE PROPERTY OF NESS &amp; CAMPBELL CRANE, INC. THIS DOCUMENT SHALL NOT BE REPRODUCED, COPIED, DISCLOSED TO OTHERS, OR USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS FURNISHED WITHOUT PRIOR WRITTEN CONSENT OF NESS &amp; CAMPBELL CRANE, INC.</p>	TITLE:		DATE:
1. MINIMUM RIGGING COMPONENTS DETAILED. ALTERNATIVE RIGGING COMPONENTS MAY BE USED GIVEN THEY MEET OR EXCEED THE COMPONENTS DETAILED.								GIRDER HOISTING		11/17/2021
								PROJECT:	CONTRACT R200	DRAWN BY: M.A.
								CUSTOMER:	SWK	APPROVED BY:
								DESCRIPTION:	RIGGING DETAILS - (1) LIFTING ASSEMBLY	SCALE: AS SHOWN
										SHEET: 3 OF 3



(<http://ospsling.com/>)



## Polyester Round Slings



### HIGHLIGHTS:

- Excellent resistance to ultra-violet rays, rot and mildew.
- Lightweight, easy to handle, store and clean.
- No loss of strength when used in water

- Only 3% elongation.
- Protects worker's hands.
- Resistant to acids, not resistant to heavy concentrations of alkalis.
- Non-sewn edge on cover, solid tube construction.
- OL1-OL4 available up to 80 feet.
- OL5-OL11 available up to 70 feet.

---

The **OSP ROUNDSLING** is a major advancement in securing almost any object to be pulled or lifted. It consists of a continuous or endless loop of 100% polyester fiber. The accumulation of numerous fiber strands determines the strength factor, as the capacity chart below shows. The multiple fiber construction makes the roundsling soft and flexible – perfect for a choked lift. The sling contours itself around the load.

---

## RATED CAPACITIES(LBS)

PART #	APPROX DIAM	COLOR	VERTICAL WLL	CHOKE WLL	BASKET WLL	WEIGHT (LBS./FT.)	WIDTH AT LOAD
OL1	.60	Purple	2,650	2,120	5,300	.2	1 <sup>1</sup> / <sub>8</sub> "
OL2	.80	Green	5,300	4,240	10,600	.3	1 <sup>1</sup> / <sub>2</sub> "
OL3	1.00	Yellow	8,400	6,720	16,800	.4	1 <sup>7</sup> / <sub>8</sub> "
OL4	1.20	Tan	10,600	8,500	21,200	.5	2 <sup>1</sup> / <sub>8</sub> "
OL5	1.30	Red	13,200	10,560	26,400	.7	2 <sup>1</sup> / <sub>4</sub> "
OL6	1.40	Orange	16,800	13,440	33,600	.8	2 <sup>1</sup> / <sub>2</sub> "

OL7	1.75	Blue	21,200	17,000	42,400	1.1	3"
OL7.5	2.00	Orange	25,000	20,000	50,000	1.35	3 <sup>1</sup> / <sub>4</sub> "
OL8	2.25	Gray	31,700	25,300	63,400	1.6	3 <sup>3</sup> / <sub>4</sub> "
OL8.5	2.50	Orange	40,000	32,000	80,000	1.75	4"
OL9	2.75	Brown	52,900	42,300	105,800	2.5	4 <sup>5</sup> / <sub>8</sub> "
OL10	3.20	Olive	66,100	52,880	132,200	3.1	5 <sup>1</sup> / <sub>4</sub> "
OL11	3.60	Black	90,000	72,000	180,000	4.0	6"
OL12	6.50	Grey	110,000	88,000	220,000	6.5	8"

## Polyester Round Slings

### Polyester Round Slings

**Eye & Eye Polyester Round Slings (<http://ospsling.com/polyester-round-slings-page/eye-eye-polyester-round-slings/>)**

## CONTACT US

**1 (800) 437-5464**

**[info@ospsling.com](mailto:info@ospsling.com)** (<mailto:info@ospsling.com>)

803 S. 3rd. Ave.  
Sequim, WA 98382

## SEARCH THE SITE

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# Crosby® Screw Pin Shackles



**G-209/S-209**

G-209 Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271F Type IVA, Grade A, Class 2, except for those provisions required of the contractor. For additional information, see page 452.

- Capacities 1/3 thru 55 metric tons, grade 6.
- Forged - Quenched and Tempered, with alloy pins.
- Working Load Limit and grade "6" permanently shown on every shackle.
- Hot Dip galvanized or self colored.
- Fatigue rated.
- Shackles 25t and larger are RFID EQUIPPED.
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Proof testing and certification available when requested at the time of order, charges will apply.
- Approved for use at -40 degrees C (-40 degrees F) to 204 degrees C (400 degrees F).
- 3.25t through 25t G209 anchor shackles are type approved to DNV Certification Notes 2.7-1 - Offshore Containers. These shackles are statistical proof and impact tested to 42 joules (31 ft-lbs.) min. avg. at -20 degrees C (-4 degrees F). The tests are conducted by Crosby and 3.1 test certification is available upon request.
- All other 209 and all 210 shackles can meet charpy requirements of 42 joules (31 ft-lbs) avg. at -20 degrees C (-4 degrees F) upon special request.
- Meets or exceeds all requirements of ASME B30.26.
- Type Approval and certification in accordance with ABS 2006 Steel Vessel Rules 1-1-17.7, and ABS Guide for Certification of Cranes.
- Crosby 3.25t through 25t G209 anchor shackles are type approved to DNV Certification Notes 2.7-1 - Offshore Containers. These Crosby shackles are statistical proof and impact tested. The tests are conducted by Crosby and 3.1 test certification is available upon request.
- Look for the Red Pin®... the mark of genuine Crosby quality.



**G-210/S-210**

G-210 Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271F Type IVB, Grade A, Class 2, except for those provisions required of the contractor. For additional information, see page 452.

**Load Rated**

**Fatigue Rated**



**QUIC-CHECK®**



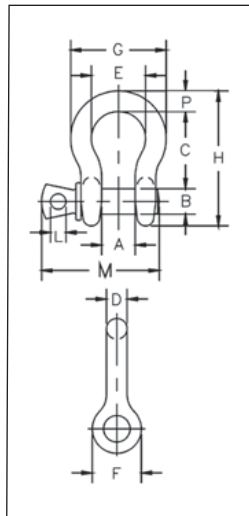
**MAXTOUGH®**



**SEE APPLICATION INFORMATION**

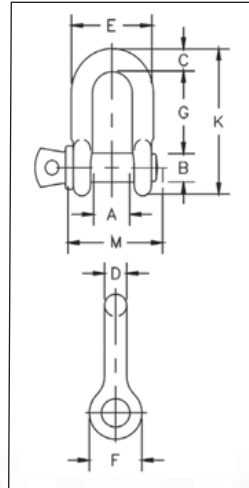
On Page 92 of the General Catalog  
Para Español: [www.thecrosbygroup.com](http://www.thecrosbygroup.com)

## G-209 / S-209 Screw Pin Anchor Shackles



Nominal Size (in.)	Working Load Limit (t)*	Stock No.		Weight Each (lbs.)	Dimensions (in.)														Tolerance + / -	
		G-209	S-209		A	B	C	D	E	F	G	H	L	M	P	C	A			
3/16	1/3	1018357	—	.06	.38	.25	.88	.19	.60	.56	.98	1.47	.16	1.14	.19	.06	.06			
1/4	1/2	1018375	1018384	.10	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.43	.25	.06	.06			
5/16	3/4	1018393	1018400	.18	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.71	.31	.06	.06			
3/8	1	1018419	1018428	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.02	.38	.13	.06			
7/16	1-1/2	1018437	1018446	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.37	.44	.13	.06			
1/2	2	1018455	1018464	.72	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06			
5/8	3-1/4	1018473	1018482	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06			
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06			
7/8	6-1/2	1018516	1018525	3.62	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06			
1	8-1/2	1018534	1018543	5.03	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.13	1.06	.25	.06			
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.71	1.25	.25	.06			
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.25	1.38	.25	.06			
1-3/8	13-1/2	1018598	1018605	13.53	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.83	1.50	.25	.13			
1-1/2	17	1018614	1018623	17.20	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10.00	.81	7.33	1.62	.25	.13			
1-3/4	25	1018632	1018641	27.78	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	1.00	9.06	2.25	.25	.13			
2	35	1018650	1018669	45.00	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	1.22	10.35	2.40	.25	.13			
2-1/2	55	1018678	1018687	85.75	4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13.00	3.13	.25	.25			

## G-210 / S-210 Screw Pin Chain Shackles



Nominal Size (in.)	Working Load Limit (t)*	Stock No.		Weight Each (lbs.)	Dimensions (in.)												Tolerance +/-	
		G-210	S-210		A	B	C	D	E	F	G	K	L	M	G	A		
1/4	1/2	1019150	1019169	.11	.47	.31	.25	.25	.97	.62	.97	1.59	.19	1.43	.06	.06		
5/16	3/4	1019178	1019187	.17	.53	.38	.31	.31	1.15	.75	1.07	1.91	.22	1.71	.06	.06		
3/8	1	1019196	1019203	.28	.66	.44	.38	.38	1.42	.92	1.28	2.31	.25	2.02	.13	.06		
7/16	1-1/2	1019212	1019221	.43	.75	.50	.44	.44	1.63	1.06	1.48	2.67	.31	2.37	.13	.06		
1/2	2	1019230	1019249	.59	.81	.63	.50	.50	1.81	1.18	1.66	3.03	.38	2.69	.13	.06		
5/8	3-1/4	1019258	1019267	1.25	1.06	.75	.63	.63	2.32	1.50	2.04	3.76	.44	3.34	.13	.06		
3/4	4-3/4	1019276	1019285	2.63	1.25	.88	.81	.75	2.75	1.81	2.40	4.53	.50	3.97	.25	.06		
7/8	6-1/2	1019294	1019301	3.16	1.44	1.00	.97	.88	3.20	2.10	2.86	5.33	.50	4.50	.25	.06		
1	8-1/2	1019310	1019329	4.75	1.69	1.13	1.00	1.00	3.69	2.38	3.24	5.94	.56	5.13	.25	.06		
1-1/8	9-1/2	1019338	1019347	6.75	1.81	1.25	1.25	1.13	4.07	2.69	3.61	6.78	.63	5.71	.25	.06		
1-1/4	12	1019356	1019365	9.06	2.03	1.38	1.38	1.25	4.53	3.00	3.97	7.50	.69	6.25	.25	.13		
1-3/8	13-1/2	1019374	1019383	11.63	2.25	1.50	1.50	1.38	5.01	3.31	4.43	8.28	.75	6.53	.25	.13		
1-1/2	17	1019392	1019409	15.95	2.38	1.63	1.62	1.50	5.38	3.62	4.87	9.05	.81	7.33	.25	.13		
1-3/4	25	1019418	1019427	26.75	2.88	2.00	2.12	1.75	6.38	4.19	5.78	10.97	1.00	9.06	.25	.13		
2	35	1019436	1019445	42.31	3.25	2.25	2.36	2.10	7.25	5.00	6.77	12.74	1.13	10.35	.25	.13		
2-1/2	55	1019454	1019463	71.75	4.12	2.75	2.63	2.63	9.38	5.68	8.07	14.85	1.38	13.00	.25	.25		

\* NOTE: Maximum Proof Load is 2.0 times the Working Load Limit. Minimum Ultimate Strength is 6 times the Working Load Limit. For Working Load Limit reduction due to side loading applications, see page 94.

CONCRETE TECHNOLOGY CORP.  
HARDWARE ORDER

DATE AUG. 2020

JOB: I-405 NB/SB MAY CREEK

JOB NO.: 19158L

RE-ISSUE

SHEET OF

8'-8½"

FLAT OF NUT & BAR  
PARALLEL TO R

1'-0"

1½"

1½"

TOP VIEW

TACK WELD EA. SIDE  
TYP.

Assembly

A

Make

32

STEEL

R ½ x 3 x 1'-3"

REBAR

MISC.

(2) 1¾" DYWIDAG BARS x 8'-8½"

(4) 1¾" x 1¾" SHORT DYWIDAG NUTS

CAPACITY = 55 TONS

WT. 72#/EA.

DOMESTIC MATERIAL REQ'D

YES

FINISH

☒

PRIME

☐

GALV.

☐

TAPE  
EDGES

☒

YES

☐

NO

SPECIAL INSTRUCTIONS

CONCRETE TECHNOLOGY CORP.  
HARDWARE ORDER

DATE AUG. 2020

JOB: I-405 NB/SB MAY CREEK

JOB NO.: 19158L

RE-ISSUE

SHEET OF

5"8"5"3"Ø HOLE FOR  
55T SHACKLE

2" CHAMFER

GOUGE ROOT  
BEFORE WELDING  
SECOND SIDE

3"2½"7"3"3"

1¾"Ø HOLE  
(2 PLACES)

R 2½ x 8 x 1'-6"

R 2½ x 8 x 0'-7"

Assembly

CTC LIFTING EYE

Make

4

STEEL

R 2½ x 8 x 1'-6"

R 2½ x 8 x 0'-7"

REBAR

WT. 130#/EA.

CAPACITY = 55 TONS

FINISH

☒

PRIME

☐

GALV.

☐

TAPE  
EDGES

☐

YES

☐

NO

SPECIAL INSTRUCTIONS

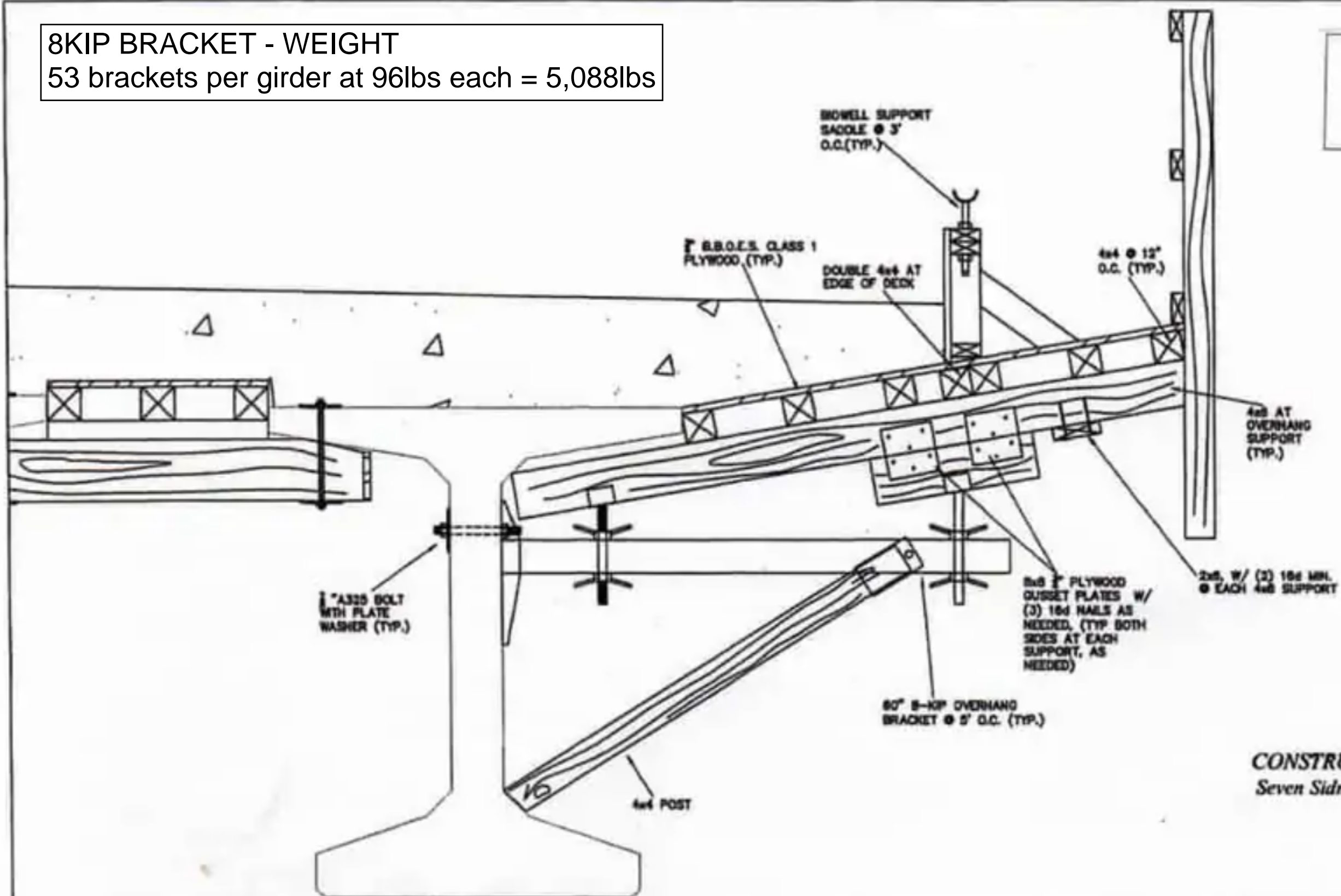
SHIP LOOSE TO

JOB SITE W/(4) EA. 4" DYWIDAG NUTS



53 brackets per girder at 96lbs each = 5,088lbs

Weight 96#



**CONSTRUCTION ENTERPRISES INC.**  
Seven Sidney Street, Mill Valley, CA 94941  
415.383.4514

NO.	REVISION NOTES	DATE	BY	ORIG.

US 395 OVER PARKSMITH  
DECK FORMWORK DESIGN  
NSC - SB LANES  
WSDOT C7867



## To whom it may concern

Date: January 17, 2008

From: Manitowoc Crane Group - Marketing

We hereby confirm that the cranes listed below by serial number are corresponding to the model as shown:

1. Serial Number 7450-8003 – Model GMK 7550
2. Serial Number 6250-8007 – Model GMK 6300
3. Serial Number 5200-8200 – Model GMK 5240
4. Serial Number 5180-8013 – Model GMK 5210
5. Serial Number 5160-8130 – Model GMK 5175
6. Serial Number 5160-8232 – Model GMK 5175
7. Serial Number 5100-208349 – Model KMK 5130

The model designation sold into North America is renamed or re-designated according to the nominal rating in US- or Short-tonnes whereas the serial numbers are based on the metric rating.

This re-designation of products is consistent with all current and non-current GMK and older KMK products sold by Manitowoc Crane Group.

If additional clarification is required, you may contact the Manitowoc Crane Group - Marketing Department at:

+1 (717) 597 5319

Andreas Gremer

Product Manager, All Terrain Cranes

Marketing / Sales Support  
Manitowoc Crane Group, Americas



Shady Grove Facility: Manitowoc Crane Group, 1565 Buchanan Trail East, Shady Grove, PA 17256 USA Tel : +1-717-597-8121 Fax: +1-717-597-4062

[www.manitowoccrane.com](http://www.manitowoccrane.com) A Manitowoc Company



# ALL TERRAIN CRANE 300 TONS

GROVE GMK6300B

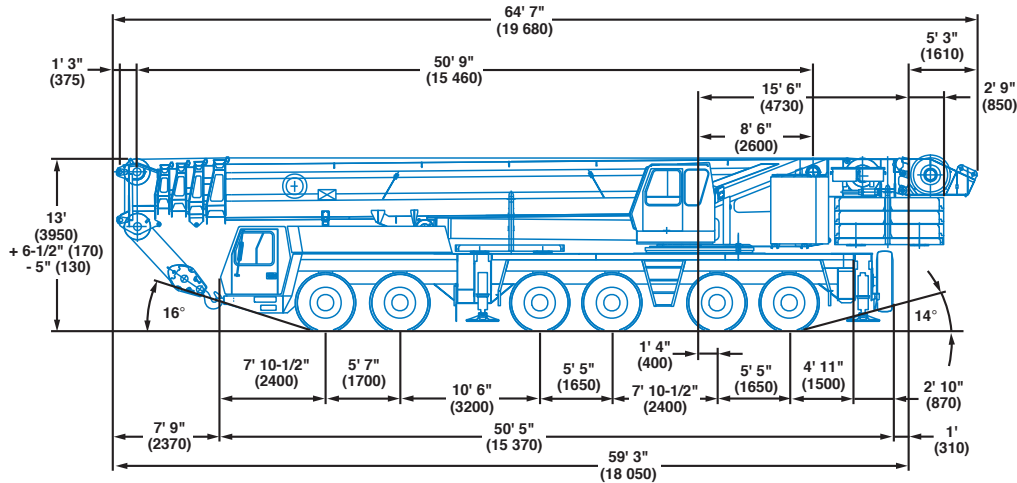
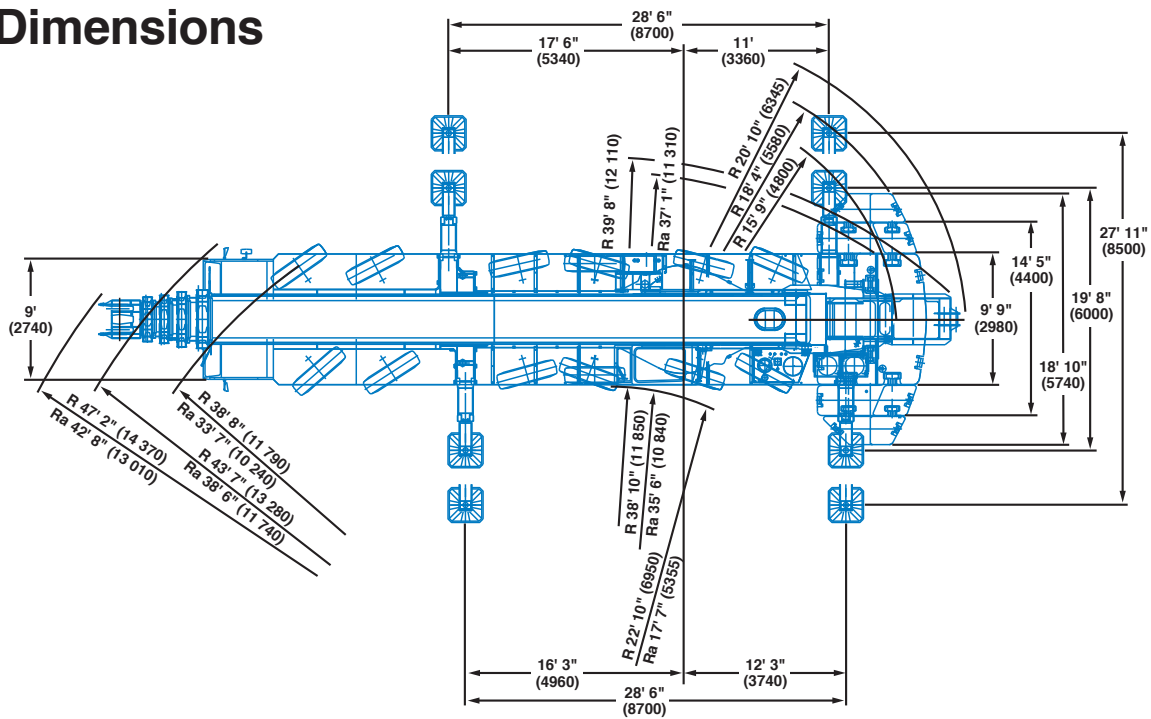
**BOOM LENGTHS:**  
51 TO 197 FT

**JIB LENGTHS:**  
36 TO 200 FT

**JIB OFFSETS:**  
LUFFING



# Dimensions



Note: ( ) Reference dimensions in mm

BASIC WEIGHTS (LBS.)	Axles 1 & 2	Axles 3 - 6	Total
With Mercedes Power	50,278	107,369	157,648
With Cummins Power	50,640	107,713	158,353
Additions:			
Outrigger Pads	-	772	772
Removable rear outrigger box option	-(1,197)	3,402	2,205
Auxiliary Hoist	-(5,362)	11,446	6,081
Removal:			
Front Outrigger Beams & Jacks	-(3,377)	-(1,980)	-(5,357)
Rear Outrigger Beams & Jacks	3,732	-(9,652)	-(5,920)
Outrigger Box (must add weight above for option)	6,457	-(16,819)	-(10,362)
Substitute 14.00 tires for standard 20.5	-(900)	-(1,800)	-(2,700)
Boom Assembly (minus lift cylinder)*	-(32,245)	-(23,995)	-(56,240)
Telescope Sections 1-4*	-(23,034)	-(13,783)	-(36,817)
Lift Cylinder*	-(2,121)	-(3,258)	-(5,379)



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[WWW.NESSCAMPBELL.COM](http://WWW.NESSCAMPBELL.COM)

# Superstructure specifications

## Boom

51 ft. - 197 ft. (15.5 m - 60 m) five section, full power boom with patented "twin-lock" boom pinning system. Maximum tip height: 207 ft. (63 m).

## Boom Elevation

Single lift cylinder with safety valve provides boom angle from -1.5° to +82°.

## Lattice Jib

Luffing Jib is a lattice design with lengths of 69 ft. - 200 ft. (21 m - 61 m) in sections of 26 ft. (8 m). The luffing jib converts to a fixed offset lattice jib using an offset angle adapter and provides lengths of 62 ft. - 167 ft. (19 m - 51 m) offsettable at 3° and 25°.

## Load Moment & Anti-Two Block System

Load moment and anti-two block system with audio/visual warning and control lever lockout provides electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.

## Cab

All aluminum construction cab is tiltable (approximately 20°) and includes safety glass and adjustable operator's seat with hydraulic suspension. Other features include engine dependent hot water heater, armrest integrated crane controls, and ergonomically arranged instrumentation.

## Swing

3 axial piston fixed displacement motors provide swing speed of 0 - 1.6 RPM thru planetary gear box. Also provided is a spring applied, hydraulically released automatic swing brake with foot-operated release for free swing.

## Counterweight

220,458 lbs. (100 000 kg) consisting of various sections with hydraulic installation/removal system (see counterweight configuration on page 16).

## Engine

Mercedes-Benz OM906LA, diesel, 6 cylinders, water cooled, turbocharged, 258 HP (190 kW) at 1800 rpm. Max. torque: 803 ft./lbs. (1100 Nm) at 1300 rpm. Engine emission: EURO II/EUROMOT/EPA/CARB (non road).

\*Optional engine: Cummins 6 CTA 8.3-260, diesel, 6 cylinders 260 HP (194 kW) at 1800 rpm. Fuel tank capacity: 87 gal. (330 L).

## Hydraulic system

4 axial piston variable displacement pumps provide four separate circuits for craning functions. Standard thermostatically controlled oil cooler keeps oil at optimum operating temperature. Tank capacity: 322 gal. (1220 L)

## Control system

Full electronic control of all crane movements is accomplished using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by a CAN-BUS.

## Hoist

Main and auxiliary hoist are powered by axial piston variable displacement motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	<u>Main</u>	<u>Auxiliary</u>
Line length:	984 ft. (300 m)	1,378 ft. (420 m)
Rope diameter:	24 mm	24 mm
Line speed:	460 ft./min.	426 ft./min.
Line pull:	24,700 lbs. (112 kN)	24,700 lbs. (112 kN)

## Electrical system

24 V system with three-phase alternator 28 V/80 A, 2 batteries 12 V/170 Ah.

## \*Optional equipment

- \*Engine-independent hot water heater, with engine pre-heater
- \*Second spotlight
- \*Stereo/cassette player
- \*Air Conditioning



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# Carrier specifications

## Chassis

Box-type, torsion resistant frame is fabricated from high-strength steel.

## Outrigger System

Hydraulic two-stage outrigger beams are extended by a single hydraulic cylinder and two cables. Outriggers can adjust to two positions:

Fully extended (100%) - 27' 11" (8.5 m)

Partially extended (50%) - 19' 8" (6 m)

Four 29.5 in. x 32 in. (750 mm x 810 mm), self stowing, steel outrigger pads provide rigid lifting base. Outrigger controls are located on both sides of the carrier. An electronic level indicator is located next to each outrigger control bos. In-cab and outrigger control station outrigger pressure readouts are also available.

## Engine

Mercedes-Benz OM502LA, diesel, 8 cylinders, water cooled, turbo charged and aftercooled, 563 HP (420 kW) at 1800 rpm. Max. torque: 1,971 ft./lbs. (2700 Nm) at 1080 rpm.

Engine emission: EURO II/EUROMOT/EPA/CARB (non road).

\*Optional engine: Cummins N525 E20 (EUROMOT/EPA/CARB - non road), diesel, 6 cylinders 533 HP (392 kW) at 1800 rpm.

Fuel Tank capacity: 132 gal. (500 L).

## Transmission

Allison automatic CLT 755, 5 forward and 1 reverse speed. Transfer case with 2 speeds and inter-axle differential lock.

## Axles

6 axles. 1, 2, 4 and 5 are drive/steer. Axles 3 and 6 are steer only. (12 x 8 x 12).

## Suspension

GMK6300B features the Grove exclusive MEGATRAK\*\* suspension. This revolutionary design features an independent hydroneumatic system with hydraulic lockout acting on all wheels. The suspension can be raised 6-1/2" (170 mm) or lowered 5" (130 mm) both longitudinally and transversely and features an automatic leveling system for on-highway travel.

## Tires

12 tires, 20.5 R25.

## Steering

Dual circuit steering system is hydraulic power assisted with a transfer case mounted, ground driven, emergency steering pump. Axles 1, 2, 3, 5 and 6 steer on highway. Separate steering of the 4th, 5th and 6th axle for all wheel steer and crab-steer is controlled by an electric rocker switch.

## Brakes

A dual circuit air system operates on all wheels with a spring-applied, air released parking brake acting on axles 2, 4, 5 and 6. An air dryer is fitted to remove moisture from the air system.

Auxiliary exhaust brake (Cummins) or transmission retarder (Mercedes) is standard.

## Cab

Two-man, aluminum construction driver's cab includes the following features: safety glass; driver and passenger seats with hydraulic suspension, engine-dependent hot water heater, complete instrumentation and driving controls.

## Electrical system

24 V system with three-phase alternator 28 V/80 A, 2 batteries 12 V/170 Ah.

## \*Optional equipment

\*Electric driveline retarder

\*12 tires, 16.00 R25 (vehicle width 9 ft. 10 in. [3 m])

\*14.00 R25 tires (vehicle width 9 ft. 9 in. [2.98 m])

\*Folding bunk bed in carrier cab

\*Engine-independent hot water heater, with engine pre-heater

\*Third seat

\*Trailing boom "boost" weight transfer kit

\*Air conditioning

\*Denotes optional equipment



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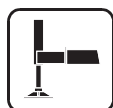




51 - 197 ft.  
(15.5 - 60 m)



220,458 lbs.  
(100 000 kg)

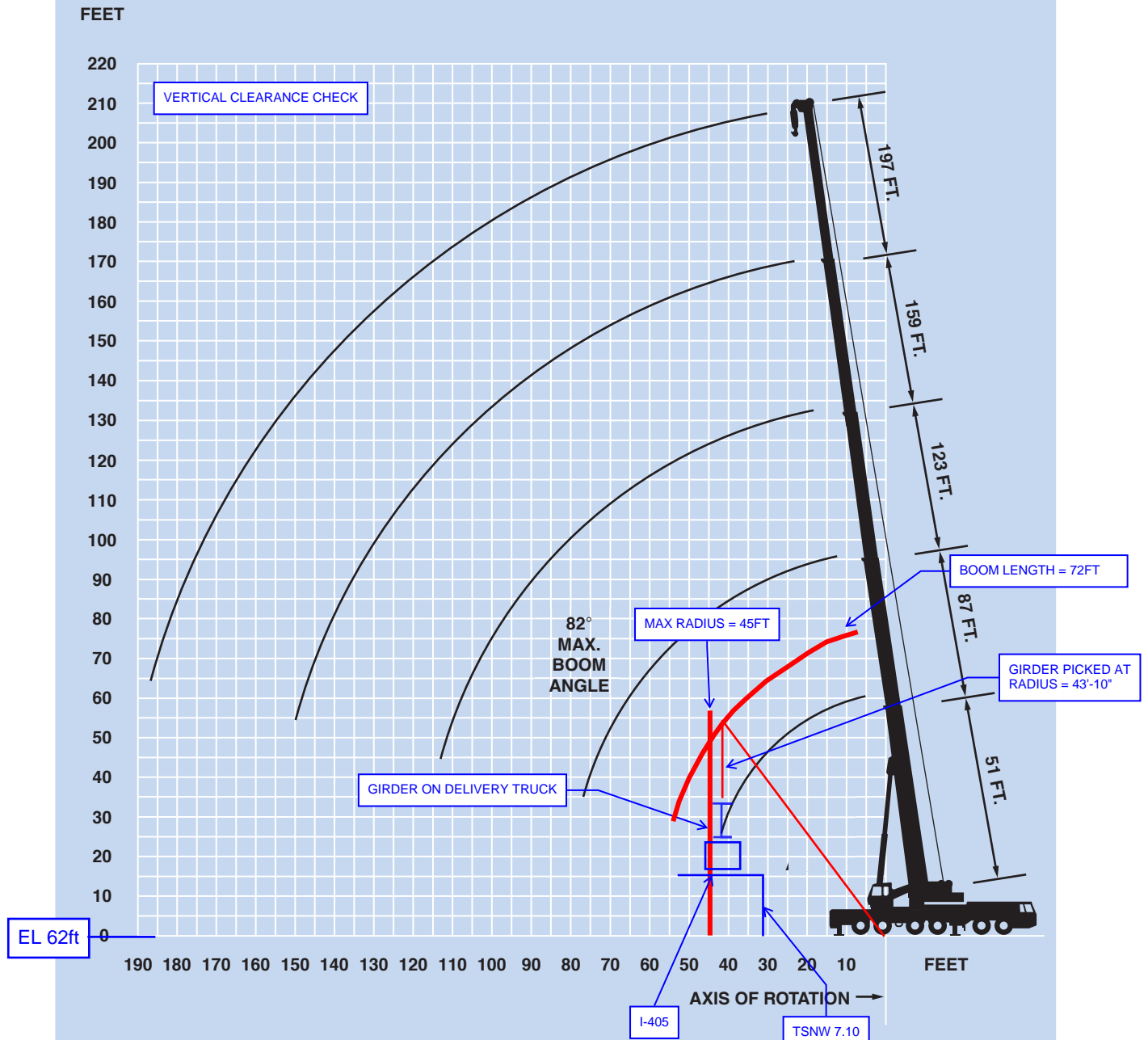






100%



360°





# Working Range



 51 - 197 ft.  
(15.5 - 60.0 m)
  220,458 lbs.  
(100 000 kg)
  100%  
28' 6" Spread
  360°

Feet	51**	51	72	87	93	108	114	136	160	181	197
*9	600.0										
10		470.0	388.0	290.0							
15		372.0	370.0	282.0	252.0	204.0					
20		306.0	302.0	258.0	224.0	201.0	177.0	140.0			
25		258.0	254.0	230.0	200.0	189.0	160.0	134.0			
30		222.0	222.0	203.0	178.0	173.0	144.0	123.0	95.0	73.0	59.0
35		188.0	188.0	181.0	160.0	156.0	130.0	113.0	95.0	73.0	59.0
40			162.0	157.0	145.0	141.0	118.0	104.0	94.0	73.0	59.0
45			142.0	137.0	132.0	128.0	107.0	95.0	90.0	73.0	59.0
50			126.0	123.0	122.0	117.0	99.0	88.0	85.0	73.0	59.0
55			112.0	112.0	110.0	107.0	91.0	81.0	79.0	71.0	59.0
60				101.0	99.0	98.0	84.0	74.0	74.0	68.0	59.0
65				91.0	89.0	88.0	78.0	70.0	69.0	64.0	58.0
70				82.0	80.0	79.0	73.0	65.0	65.0	60.0	55.0
75				46.0	73.0	71.0	68.0	61.0	61.0	57.0	52.0
80						65.0	64.0	57.0	57.0	53.0	50.0
85						59.0	60.0	53.0	53.0	50.0	47.0
90						54.0	56.0	50.0	50.0	47.0	45.0
95						39.4	53.0	47.0	47.0	45.0	43.0
100								44.0	44.0	42.2	40.8
105								42.6	42.0	40.2	38.8
110								40.6	39.8	38.2	37.0
115								38.6	37.6	36.0	35.0
120								36.6	35.8	34.4	33.4
125									34.0	32.6	31.8
130									32.0	30.8	30.0
135									29.8	29.2	28.4
140									23.6	27.4	26.8
145									22.2	25.6	25.2
150									19.4	24.2	23.8
155										23.2	22.8
160										22.4	22.0
165										18.0	21.0
170										15.6	20.2
175											19.2

\*Lifting capacities greater than 430,000 lbs. (195 050 kg) require special equipment. \*\*Over rear only, 28' 6" x 9' 4" (100% Front, 0% Rear) outrigger base.

 51 - 197 ft.  
(15.5 - 60.0 m)
  220,458 lbs.  
(100 000 kg)
  50%  
19' 8" Spread
  360°

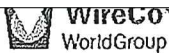
Feet	50.72	71.78	71.95	72.05	72.21	86.51	87.01	87.5	87.99
10	526.0	242.0	133.0	189.0	388.0	290.0	206.0	146.0	
15	400.0	242.0	133.0	189.0	382.0	282.0	206.0	146.0	121.0
20	332.0	242.0	133.0	189.0	316.0	258.0	206.0	146.0	121.0
25	268.0	242.0	133.0	189.0	264.0	230.0	205.0	138.0	107.0
30	222.0	222.0	127.0	178.0	218.0	203.0	181.0	122.0	95.0
35	188.0	188.0	115.0	159.0	184.0	181.0	162.0	109.0	85.0
40		162.0	105.0	144.0	159.0	157.0	147.0	99.0	78.0
45		142.0	97.0	130.0	138.0	137.0	133.0	90.0	71.0
50		126.0	90.0	120.0	122.0	121.0	123.0	83.0	65.0
55		112.0	84.0	110.0	109.0	107.0	112.0	76.0	61.0
60						96.0	101.0	70.0	56.0
65						86.0	91.0	66.0	53.0
70						77.0	82.0	61.0	49.0
75									46.0



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# 300T WIRE ROPE DATA



WireCo WorldGroup  
12200 NW Ambassador Drive  
Kansas City, MO 64163-1244

300 MAIN LINE  
INSTALLED 7/7/2017

Kunde:  
Customer:

WireCo WorldGroup

2400 W 75th Street  
Prairie Village KS 66208-3509  
USA

Auslieferer:  
Supplier:



**CASAR**

Drahtseilwerk Saar GmbH  
Postfach 1187  
D-66454 Kirdel  
Deutschland / Germany

## Abnahmeprüfzeugnis nach DIN EN 10204 3.1

MILL TEST CERTIFICATE according to DIN 10204 3.1

Zertifikat Nr.:  
Certificate No: W6 00640621

Ausstelldatum:  
Date of issue: 14.04.2016

Ihre Bestellung Nr.:  
Order No: 1469200P

vom:  
of: 07.01.2016

Unsere Komm. Nr.:  
Job No: SO 16400495

vom:  
of: 26.01.2016

Unsere Rechnung Nr.:  
Invoice No:

vom:  
of:

Konstruktion:  
Product Description: CASAR Eurolift non-rotating

Artikelnummer:  
Item No: 103996

Bemerkung:  
Notice:

Nenn Durchmesser:  
Nominal diameter: 24,00 mm  
0,94 in

FAB Nr.:  
FAB No: 701-620349-1-1

Aktueller Seildurchmesser:  
Actual diameter: 24,800 mm  
0,98 in

Chargen Nr.:  
Lot No: 701-620349-1

Länge/n:  
Cut length(s): 1 x 3.294,00 m  
1 x 10.806,96 ft

Einlage:  
Core type: Stahleinlage  
Steel

Nennzugfestigkeit:  
Tensile strength: 2160 N/mm2

Schlagart:  
Type of lay: Gleichschlag Links  
Left Hand Langs Lay

Mindestbruchkraft:  
Minimum breaking load: 564,10 kN  
126815 lbf

Oberfläche der Drähte:  
Surface of wire: blank  
Ungalvanized

Wirkliche Bruchkraft:  
Actual breaking load: 574,90 kN  
129243 lbf

Längengewicht:  
Average weight per unit length: 284,300 kg/100 m

Tragende Drähte in den Außenlitzen:  
Load-bearing wires of outer strands:

126

Außendrahtdurchmesser:  
Outer wire diameter:

Testdatum:  
Date of Test: 04.04.2016

Hersteller / Manufacturer

**CASAR**

Dieses Schreiben wurde elektronisch erstellt und ist  
damit auch ohne Unterschrift gültig

QUALITÄTSSICHERUNG / J. Weirich  
Verantwortlicher / Person responsible



Haftungsschrift: CASAR DRAHTSEILWERK SAAR GMBH - Casarstraße 1 - D-66459 Kirdel - Telefon (0 68 41) 80 91-0 Telefax (0 68 41) 80 91-399  
Geschäftsführer: Jörg Heims, Andreas Schmeiss, José Luis Gramago - Amtsgericht Saarbrücken HRB 17125 - Sitz der Gesellschaft: Kirdel  
BANKKONTEN: BNP Paribas S.A. - Niederlassung Deutschland - BLZ 370 106 00 Konto-Nr. 1029341361 - IBAN: DE15 3701 0600 1029 3413 61 - SWIFT/BIC-Code: GEBAD33 - SWIFT/BIC-Code ausschließlich für AKKredit e. BNPAD33

# 300T LOAD BLOCK DATA

---

**From:** Drew Allemandi <d.allemandi@nesscampbell.com>  
**Sent:** Thursday, December 2, 2021 12:39 PM  
**To:** Alexander, Ilima (external); Tim McGee  
**Cc:** Anderson, Steve (external); Creamer, Brent; Estelle, Evan  
**Subject:** RE: Bride 25E Girder Pick  
**Attachments:** 300T - WIRE ROPE DATA.pdf

**CAUTION: This email came from outside of the organization. Think before clicking on links and attachments.**

The wire rope and block data I sent for the 500T is all I have. The block is a Liebherr block, so the capacity should match what is shown in the product guide. I will see if I can get someone to snap a picture of the block tag.

For the 300T. I don't have any pictures of the medium 3 sheave block. I know the weight is 2,500 lbs. and capacity is 175k. I attached what I have on the wire rope.

Please let me know if you need anything else. Thank you.

Drew Allemandi, P.E.  
206.406.4771

---

**From:** Alexander, Ilima (external) <ialexander@FlatironLaneJV.com>  
**Sent:** Thursday, December 2, 2021 12:24 PM  
**To:** Drew Allemandi <d.allemandi@nesscampbell.com>; Tim McGee <T.McGee@nesscampbell.com>  
**Cc:** Anderson, Steve (external) <sanderson@FlatironLaneJV.com>; Creamer, Brent <BCreamer@flatironcorp.com>; Estelle, Evan <eestelle@flatironcorp.com>  
**Subject:** RE: Bride 25E Girder Pick

Thanks!

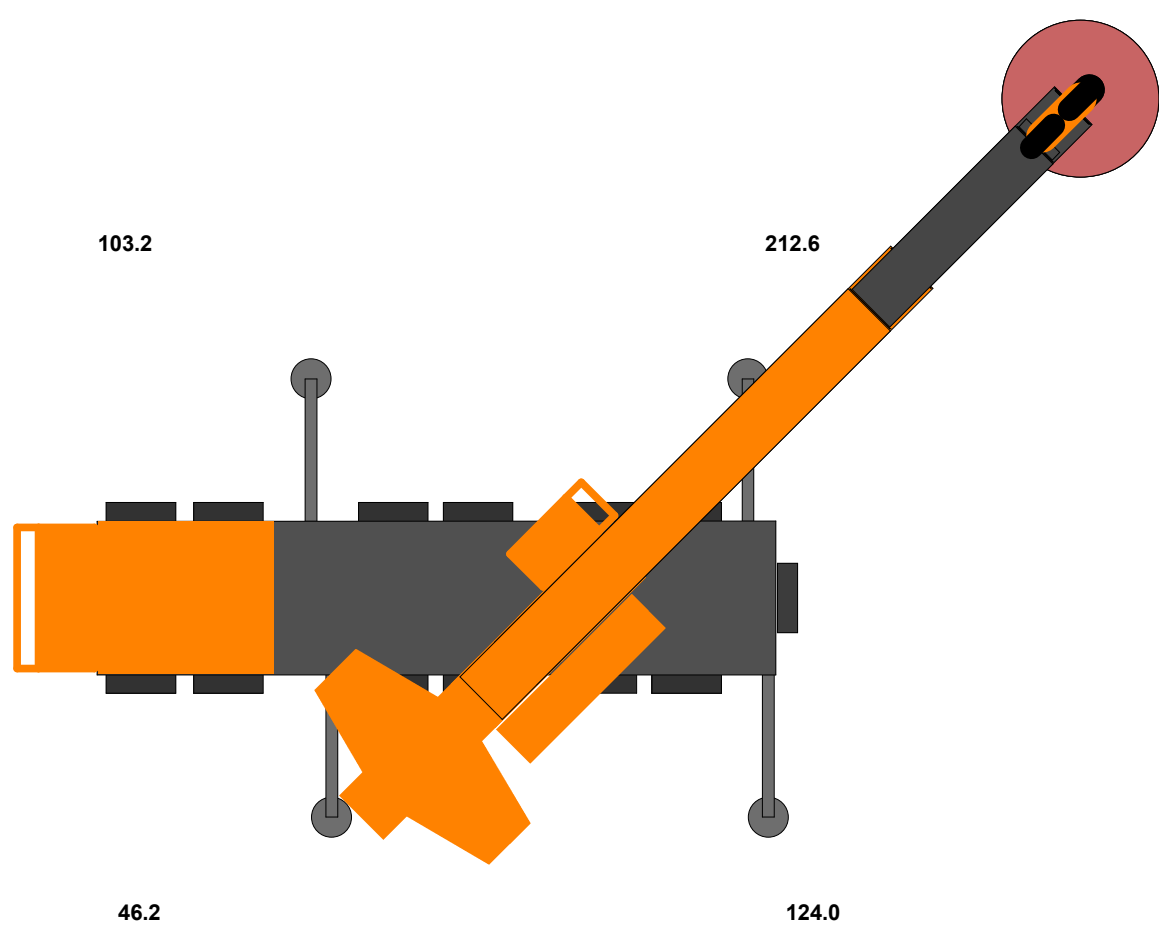
I didn't see an email come through with block and wire rope for the 300TON?

Do you have another version you could send for the following:

- 500T wire rope data – see snip below, the text looks distorted from my end
- 500T block data – The text in photos is blurry

<b>Compu-Crane</b> 12-07-2021 Plan View: Grove GMK6300B Tip Height: 59.9 (ft) Counterweight: 220,500# Original Load Weight: 113,000.0 (lb)		Load Radius (ft)	Boom Length (ft)		
	Crane:	45.0	71.8	Load Weight:	113,000
	Chart:	45.0	71.8	Capacity (lb):	142,000
	Grove GMK6300B - 50.7' - 196.9' Main Boom Only, 100% Outriggers, 220,500# Cwt, 360 Deg, 85% Cap, [3047530]				

300T OUTRIGGER LOADS



# ALL TERRAIN CRANE 550 TONS

GROVE GMK7550

BOOM LENGTHS:  
53 TO 197 FT

JIB LENGTHS:  
82 TO 240 FT

JIB OFFSETS:  
LUFFING



# NOTES:



# Specifications

## Superstructure



### Boom

16 m - 60 m (53 ft - 197 ft) five-section, full power boom with patented TWIN-LOCK™ boom pinning system. Maximum tip height: 63 m (207 ft).



### Boom elevation

Two lift cylinders with safety valves provide boom angles from -1.2° to +82°.



### \*Lattice jib

Luffing jib is a lattice design with lengths of 25 m - 79 m (82 ft - 259 ft) in sections of 6,2 m (20 ft) and 12,2 m (40 ft). The luffing jib converts to a fixed offset lattice jib providing lengths of 12 m - 70 m (39 ft - 230 ft) offsettable at 3° and 25°.



### Load moment and anti-two block system

Graphic display load moment and anti-two block system with audio/visual warning and control lever lockout. These systems provide electronic display of boom angle, length, radius, tip height, relative load moment, maximum permissible load, load indication and warning of impending two-block condition.



### Cab

All aluminum construction cab is tiltable (approximately 20°) and includes safety glass and adjustable operator's seat. Other features include engine independent hot water heater including 24 hour timer, air conditioning, armrest integrated crane controls, and ergonomically arranged instrumentation. Cab hydraulically stows to the rear of the superstructure for highway travel.



### Swing

Three axial piston fixed displacement motors provide swing speed of 0 - 1.1 RPM thru planetary gear box. Also provided is a spring applied, hydraulically released automatic swing brake with foot operated release for free swing.



### Counterweight

120 t (264,500 lb) consisting of various sections with hydraulic installation/removal system (see counterweight configuration on page 12).



### Engine

Mercedes OM906LA, diesel, 6 cylinders, water cooled, turbocharged, 205 kW (279 hp) at 1800 rpm. Max. torque: 1100 Nm (811 ft/lb) at 1200 rpm. Engine emission: EUROMOT/EPA/CARB Tier III (non-road).



### Fuel tank capacity

300 L (79 gal).



### Hydraulic system

Five separate circuits, Three axial piston variable displacement pumps with electronic power limiting control, 1 axial piston variable displacement pump for slewing and 1 fixed displacement pump for auxiliary gears. Standard thermostatically controlled oil coolers keep oil at optimum operating temperature. Tank capacity: 1570 L (415 gal)



### Control system

Full electronic control of all crane movements is accomplished using electrical control levers with automatic reset to zero. Controls are integrated with the LMI and engine management system by CAN-BUS.



### Electrical system

24 V system with three-phase alternator 28 V/100 A  
2 batteries 12 V/170 Ah.

# Specifications

## Superstructure continued



### Hoist

Main and auxiliary hoist are powered by axial piston variable displacement motor with planetary gear and brake. "Thumb-thumper" hoist drum rotation indicator alerts operator of hoist movement.

	Main Auxiliary	Auxiliary
<b>Line length</b>	460 m (1509 ft)	690 m (2264 ft)
<b>Rope diameter</b>	24 mm	24 mm
<b>Line speed</b>	130 m/min (427 fpm)	130 m/min (427 fpm)
<b>Line pull</b>	110 kN (24,729 lb)	104 kN (23,380 lb)

Hoist cameras and lights included.

### \*Optional hookblocks

Lifting capacity	Sheaves	Weight	Possible load with the crane*
320 t (353 USt)	11	3500 kg (7716 lb)	231 t / 277 t* (255 USt / 305 USt*)
250 t (275 USt)	9	3000 kg (6614 lb)	231 t (255 USt)
200 t (220 USt)	7	2400 kg (5291 lb)	184 t (203 USt)
160 t (176 USt)	5	1800 kg (3669 lb)	136 t (150 USt)
100 t (110 USt)	3	1300 kg (2866 lb)	88 t (97 USt)
40 t** (44 USt)	1	850 kg (1874 lb)	38 t (42 USt)
16 t*** (18 USt)	H/B	450 kg (992 lb)	12,5 t (13.8 USt)

\* Requires additional boom nose sheave

\*\* Required for overhaul of single part line with boom/jib lengths in excess of 99,4 m (326 ft)

\*\*\* Overhaul weight designed for a maximum of 99,4 m (326 ft) boom/jib lengths

### \*Optional equipment

- ▶ Second spotlight on superstructure cab
- ▶ Stereo/CD player
- ▶ Lift enhancement system (MegaWingLift™)
- ▶ Additional 40 t (88,200 lb) counterweight for MegaWingLift™
- ▶ Worklights on boom base section
- ▶ Aircraft warning lights
- ▶ Hook blocks
- ▶ Adapter for heavy duty jib
- ▶ 360° positive swing lock

## Carrier



### Chassis

Special seven-axle carrier, welded torsion resistant frame is fabricated from high-strength steel.



### Outrigger system

Hydraulic two-stage outrigger beams are extended by a single hydraulic cylinder and two cables. Outriggers can adjust to two positions:

Fully extended (100%) - 8,9 m (29.2 ft)  
Partially extended (50%) - 6,1 m (20 ft)

Four 810 mm x 810 mm (32 in x 32 in), self stowing, steel outrigger pads provide rigid lifting base. Outrigger controls are located on both sides of the carrier. Electronic level indicators with automatic levelling system. Outrigger pad load indication through ECOS and carrier controls. Includes outrigger monitoring system.



### Engine

Mercedes, diesel, 8 cylinders, water-cooled, turbocharged, 420 kW (563 hp) at 1800 rpm. Max. torque: 2700 Nm (1991 ft lb) at 1300 rpm. Engine emission: EUROMOT/EPA/CARB Tier III (non-road).



### Fuel tank capacity

500 L (132 gal).

# Specifications

## Carrier continued



### Transmission

Allison automatic 4800 SP-R, seven forward and one reverse speed. Transfer case with two speeds and inter-axle differential lock. Hydraulic transmission retarder.



### Drive/steer

14x6x14



### Axles

Seven axles. 1, 4 and 5 are drive/steer. Axles 2, 3, 6 and 7 are steer only.



### Suspension

GMK7550 features the Grove exclusive MEGATRAK™ suspension. This revolutionary design features an independent hydroneumatic system with hydraulic lockout acting on all wheels. The suspension can be raised 170 mm (6 - 1/2 in) or lowered 130 mm (5 in) both longitudinally and transversely and features an automatic leveling system for on-highway travel.



### Tires

14 tires 445/95 R25 (16.00 R25)  
(vehicle width: 3,00 m [9.8 ft])



### Steering

Dual circuit steering system is hydraulic power assisted with emergency steering pump. Axles 1, 2, 3, 6 and 7 steer on highway. Separate steering of the 4th, 5th, 6th and 7th axles for all wheel steer and crab-steer, controlled by an electric rocker switch.



### Brakes

A dual circuit air system operates on all wheels with a spring-applied, air released parking brake acting on axles 2, 4, 5 and 7. An air dryer is fitted to remove moisture from the air system. Standard engine compression brake and transmission retarder.



### Cab

Two-man, aluminum construction driver's cab includes the following features: safety glass; driver seat with pneumatic suspension, engine-dependent hot water heater and air conditioning. Complete instrumentation and driving controls.



### Electrical system

24 V system with three-phase alternator 28 V/100 A, 2 batteries 12 V/170 Ah.



### Maximum speed

85 km/h (53 mph) with 20.5 R25 tires.



### Gradeability (theoretical)

32% with 20.5 R25 tires (14x6x14)  
50% with 20.5 R25 tires (14x8x14)

## Miscellaneous standard equipment

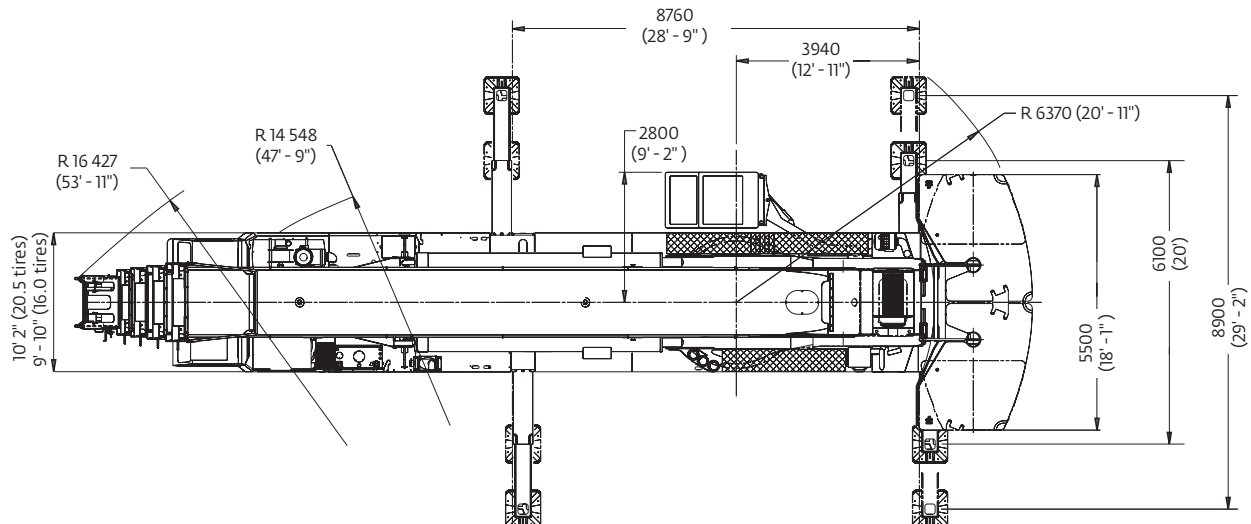
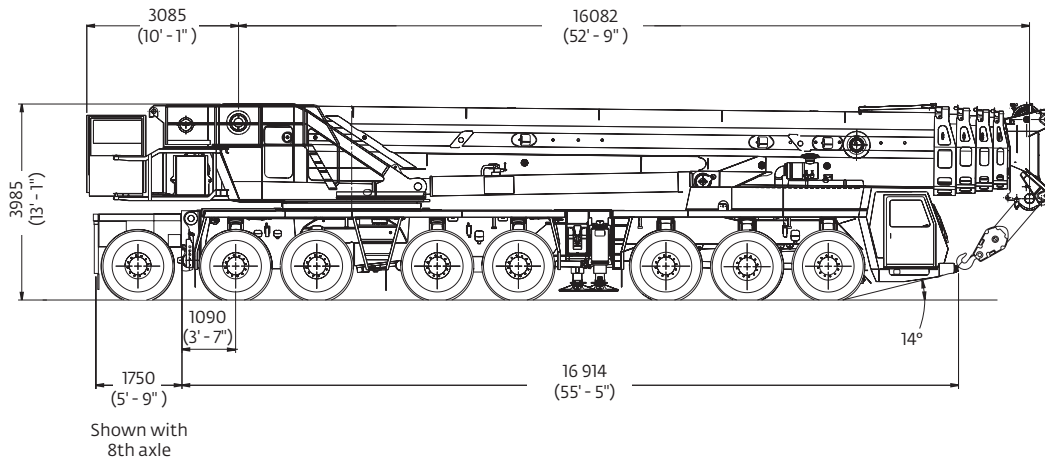
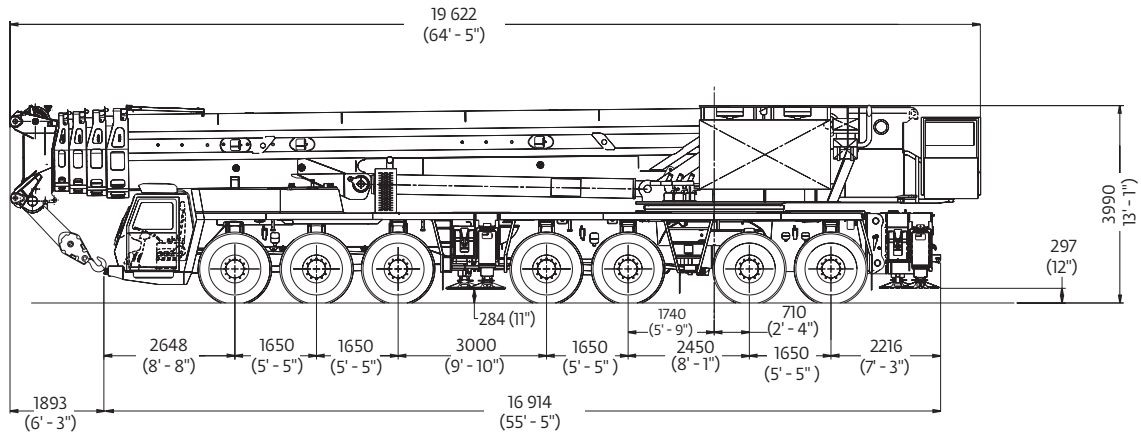
Boom removal kit; trailing boom kit (less dolly), additional hydraulic oil cooler; removable rear outrigger box; tool kit; fire extinguisher; radio/cd player in carrier cab, CraneSTAR asset management system.

## \*Optional equipment

- ▶ 14 x 8 x 14 (1,2,4 and 5 are drive/steer)
- ▶ Engine-independent hot water heater, with engine pre-heater
- ▶ 14 tires, 385/95 R25 (14.00 R25).  
(vehicle width 3,00 m [9.8 ft])
- ▶ 14 tires, 525/80 R25 (20.5 R25).  
(vehicle width 3,1 m [10.2 ft])
- ▶ Aluminum rims
- ▶ Auxiliary axle, pinned when rear outrigger box is removed
- ▶ Hinged bunk bed
- ▶ Working range limiter
- ▶ Reversing camera system
- ▶ Engine shutdown valves (for both engines)



# Dimensions

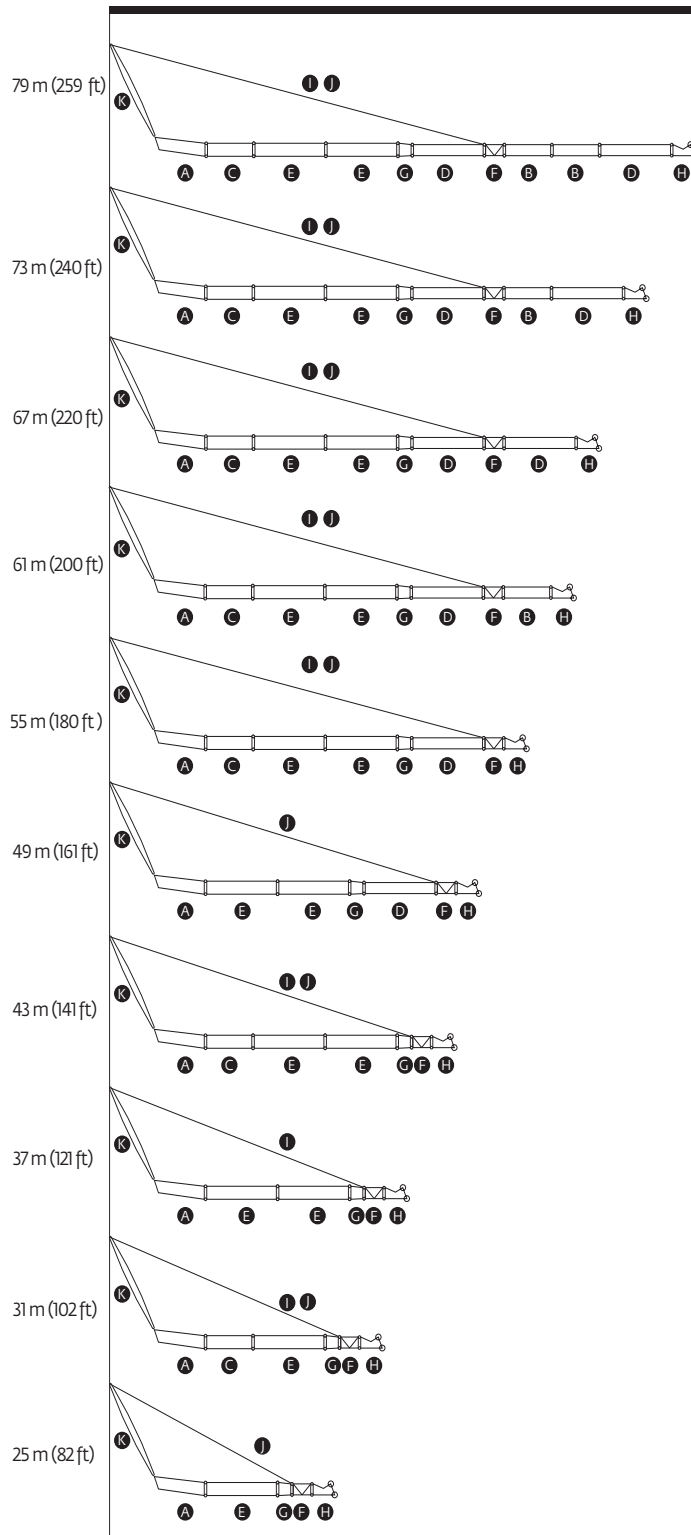


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# Dimensions

## Luffing jib combinations

Without angle offset

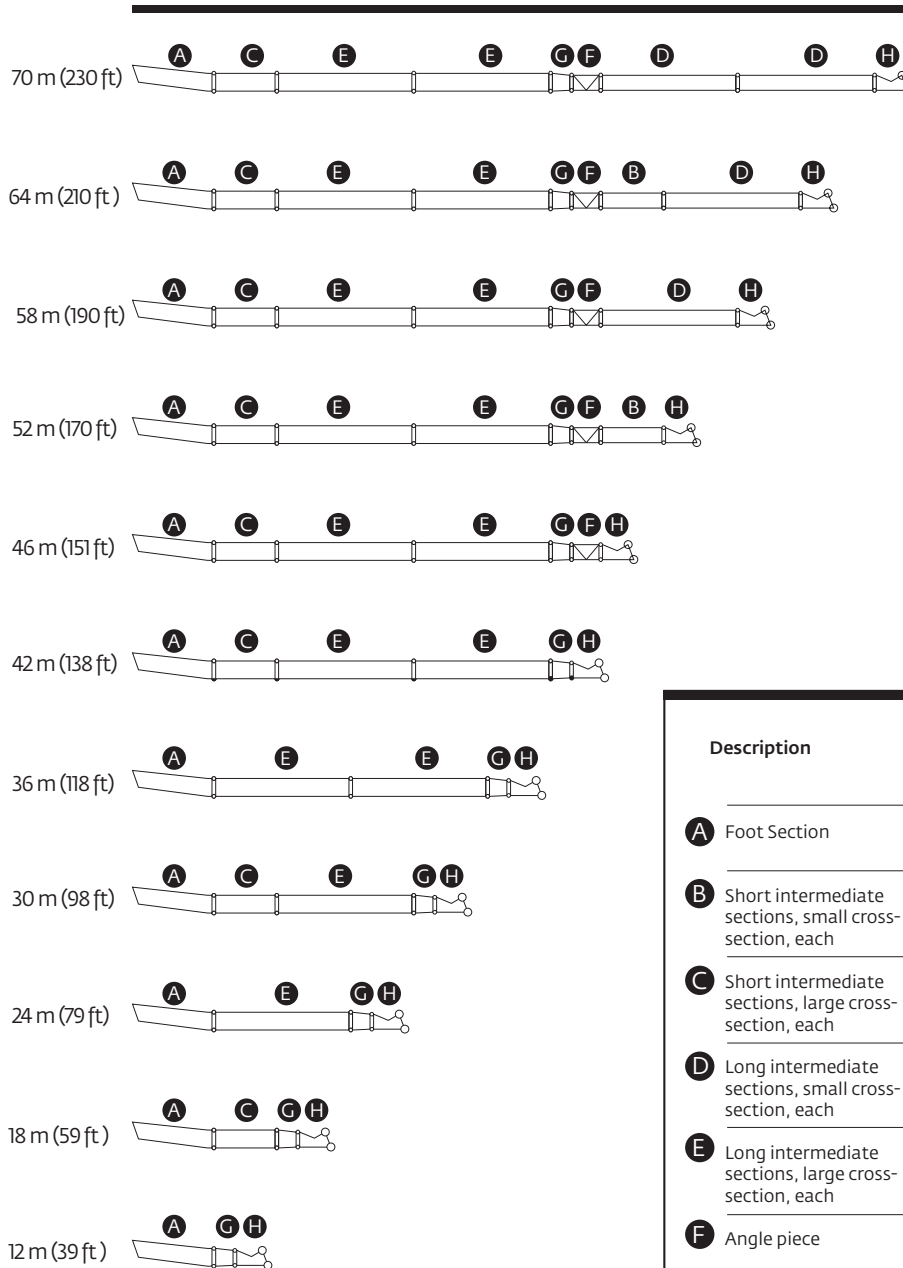


Description	Length x width x height m (ft)	Weight in kg (lb)
<b>A</b> Foot Section	8.80 x 1.80 x 2.50 (28.87 x 5.90 x 8.20)	3700 (8160)
<b>B</b> Short intermediate sections, small cross-section, each	6.20 x 1.50 x 1.500 (20.34 x 4.91 x 4.91)	900 (1985)
<b>C</b> Short intermediate sections, large cross-section, each	6.20 x 1.80 x 1.90 (20.34 x 5.90 x 6.23)	1000 (2205)
<b>D</b> Long intermediate sections, small cross-section, each	12.20 x 1.50 x 1.50 (40.03 x 4.91 x 4.91)	1600 (3530)
<b>E</b> Long intermediate sections, large cross-section, each	12.20 x 1.80 x 1.90 (40.03 x 5.90 x 6.23)	1600 (3530)
<b>F</b> Angle piece	3.70 x 1.50 x 1.80 (12.14 x 4.91 x 5.90)	1600 (3530)
<b>G</b> Reducing piece	1.20 x 1.80 x 1.90 (3.94 x 5.90 x 6.23)	500 (1105)
<b>H</b> Head piece	3.20 x 1.50 x 2.10 (10.50 x 4.91 x 6.89)	1200 (2650)
<b>I</b> Rear pendant link for short intermediate section	6.20 x 0.20 x 0.20 (20.34 x 0.70 x 0.70)	200 (440)
<b>J</b> Rear pendant link for long intermediate section	12.20 x 0.20 x 0.20 (40.03 x 0.70 x 0.70)	400 (880)
<b>K</b> Luffing control arm with fall-back guard strut	12.20 x 2.10 x 1.80 (40.03 x 6.89 x 5.90)	3200 (*7055)

\*Individual weight of rear pendant link: 360 kg (795 lb)

## Lattice boom extension combinations

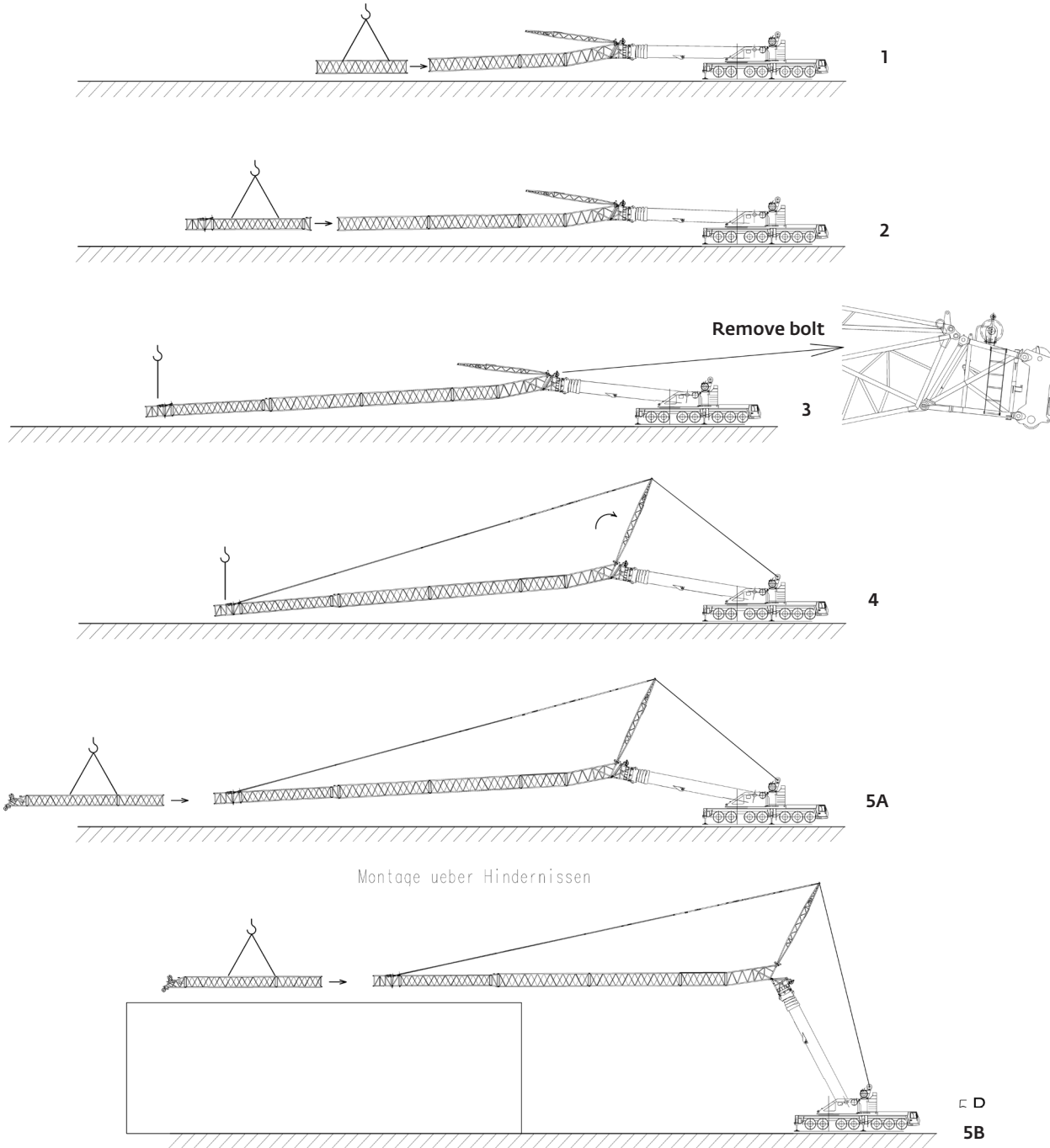
Without angle offset



Description	Length x width x height m (ft)	Weight in kg (lb)
<b>A</b> Foot Section	8.80 x 1.80 x 2.50 (28.87 x 5.90 x 8.20)	3700 (8160)
<b>B</b> Short intermediate sections, small cross-section, each	6.20 x 1.50 x 1.50 (20.34 x 4.91 x 4.91)	900 (1985)
<b>C</b> Short intermediate sections, large cross-section, each	6.20 x 1.80 x 1.90 (20.34 x 5.90 x 6.23)	1000 (2205)
<b>D</b> Long intermediate sections, small cross-section, each	12.20 x 1.50 x 1.50 (40.03 x 4.91 x 4.91)	1600 (3530)
<b>E</b> Long intermediate sections, large cross-section, each	12.20 x 1.80 x 1.90 (40.03 x 5.90 x 6.23)	1600 (3530)
<b>F</b> Angle piece	3.70 x 1.50 x 1.80 (12.14 x 4.91 x 5.90)	1600 (3530)
<b>G</b> Reducing piece	1.20 x 1.80 x 1.90 (3.94 x 5.90 x 6.23)	500 (1105)
<b>H</b> Head piece	3.20 x 1.50 x 2.10 (10.50 x 4.91 x 6.89)	1200 (2650)

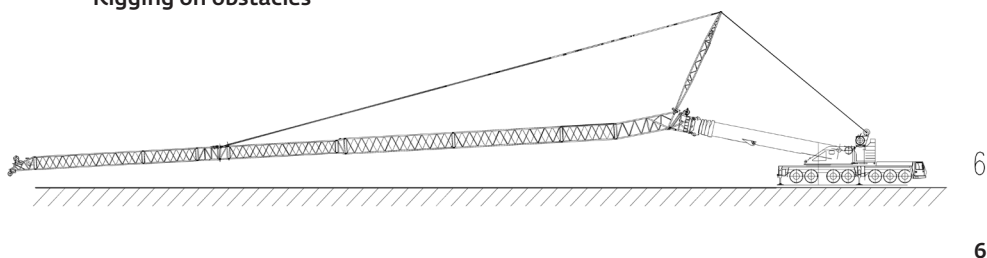
# Dimensions

## Aerial rigging of jib



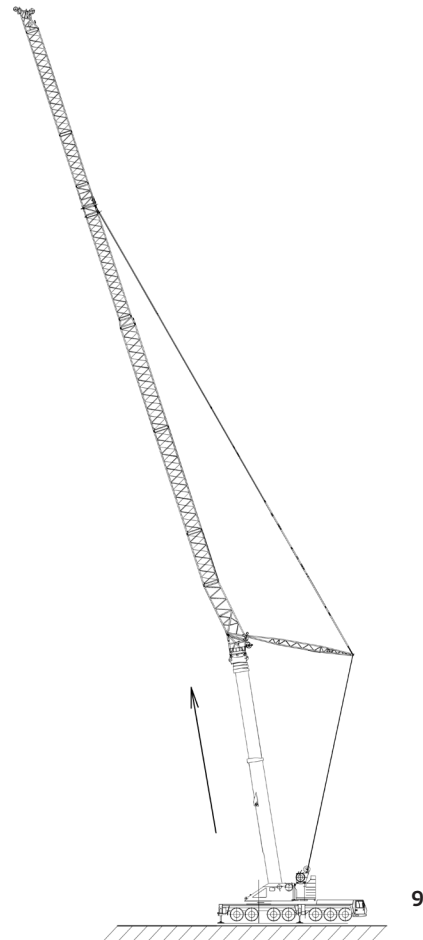
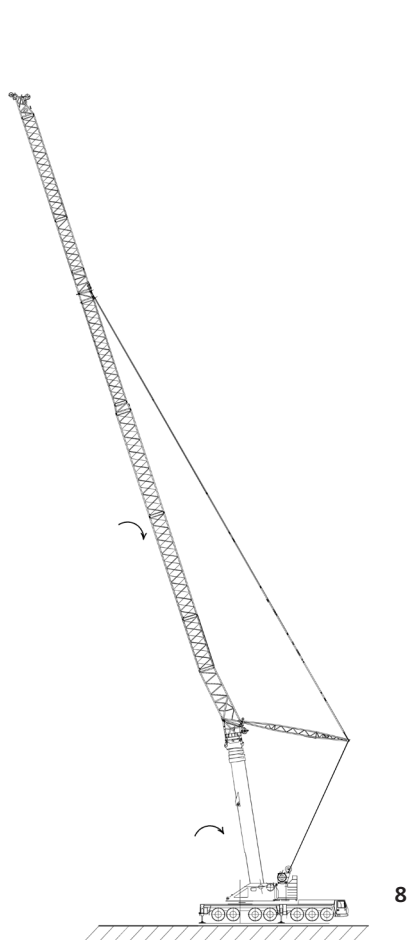
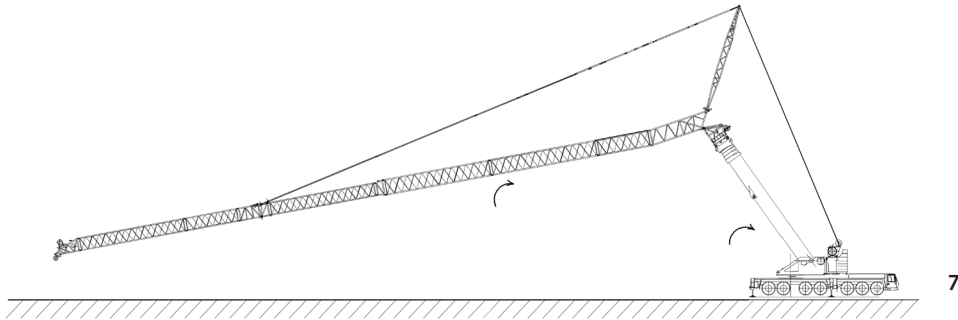
Montage ueber Hindernissen

## Rigging on obstacles



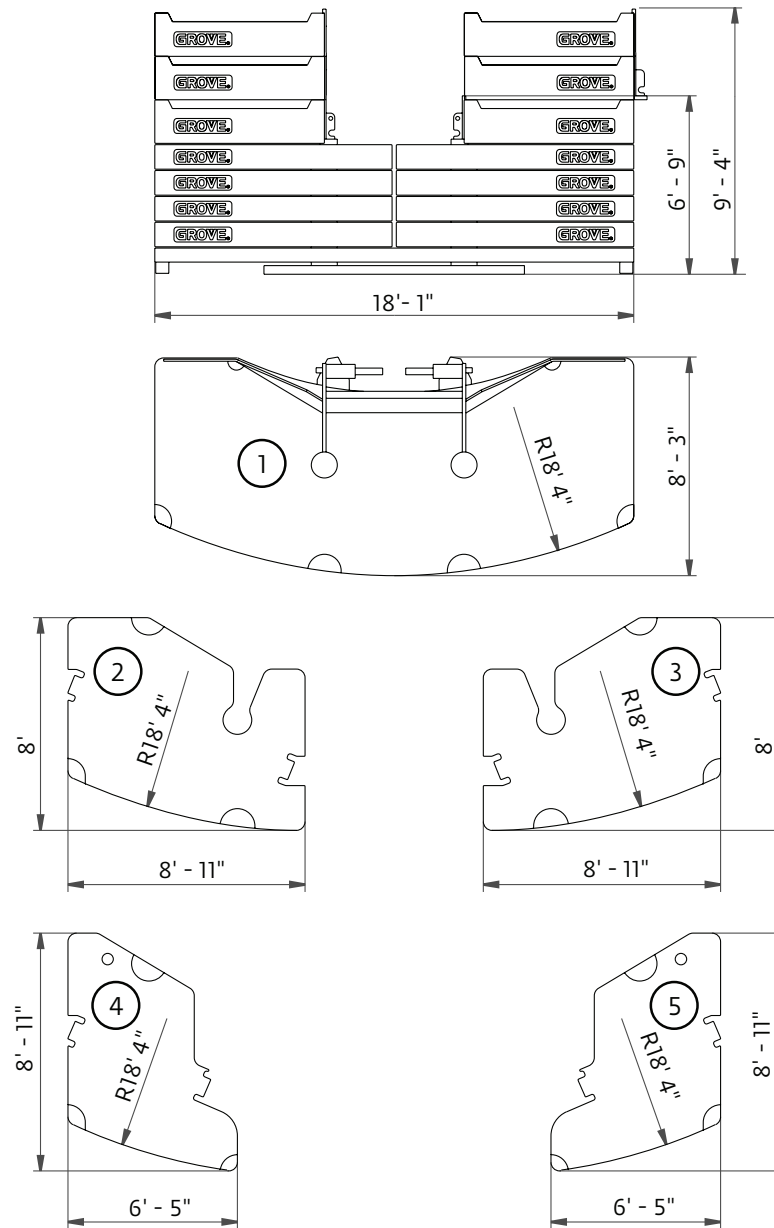
# Dimensions

## Aerial rigging of jib





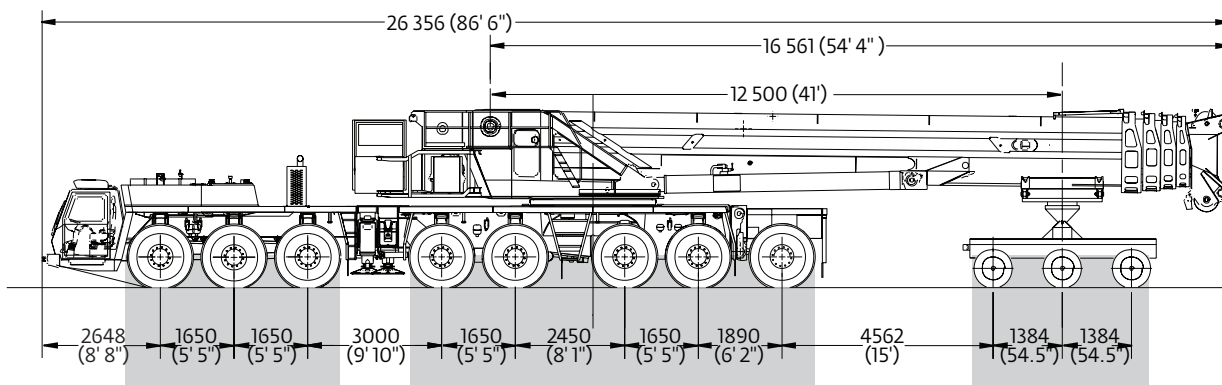
# Counterweight



	1	2	3	4	5
	20 t (44,000 lb)	10 t (22,000 lb)	10 t (22,000 lb)	10 t (22,000 lb)	10 t (22,000 lb)
20,0 t (44,000 lb)	x				
40,0 t (88,100 lb)	x	x	x		
60,0 t (132,200 lb)	x	2 x	2 x		
80,0 t (176,000 lb)	x	3 x	3 x		
100,0 t (220,400 lb)	x	4 x	4 x		
120,0 t (264,500 lb)	x	4 x	4 x	x	x
140,0 t (308,600 lb)	x	4 x	4 x	2 x	2 x
160,0 t (352,700 lb)	x	4 x	4 x	3 x	3 x

# Travel proposals

## Trailing boom dolly with 8th axle



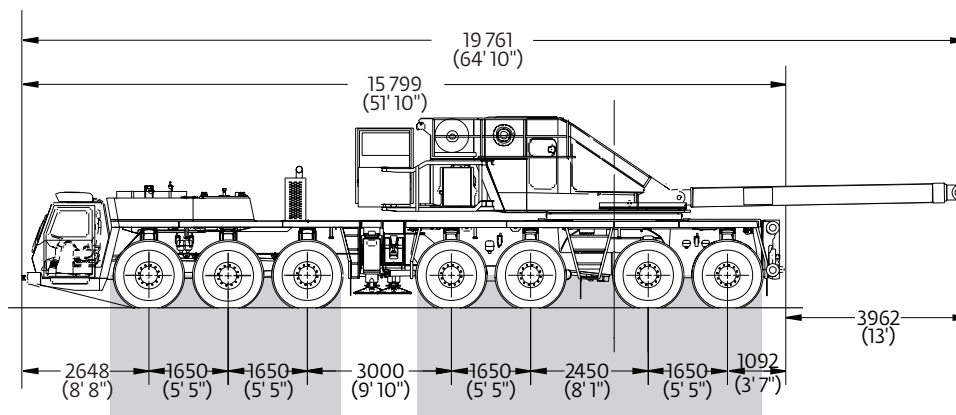
	Axles 1 - 3	Axles 4 - 8	Dolly	Total GVW
Boom in dolly over rear, rear outrigger box removed, 8th axle installed	26 254 kg (57,879 lb)	38 388 kg (84,631 lb)	26 822 kg (59,132 lb)	91 464 kg (201,642 lb)

### Unit equipped with:

- 20.5 tires on aluminum rims - axles 1 through 8
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware
- Dolly weight: 3900 kg (8600 lb)

Allow 3% variation in weight due to manufacturing tolerances

## Boom removed, superstructure over rear



	Axles 1 - 3	Axles 4 - 7	Total GVW
Boom removed, superstructure over rear	16 717 kg (36,855 lb)	34 879 kg (76,895 lb)	51 597 kg (113,750 lb)

### Unit equipped with:

- Rear outrigger box removed
- 20.5 tires on aluminum rims
- Operator, 75 kg (165 lb)

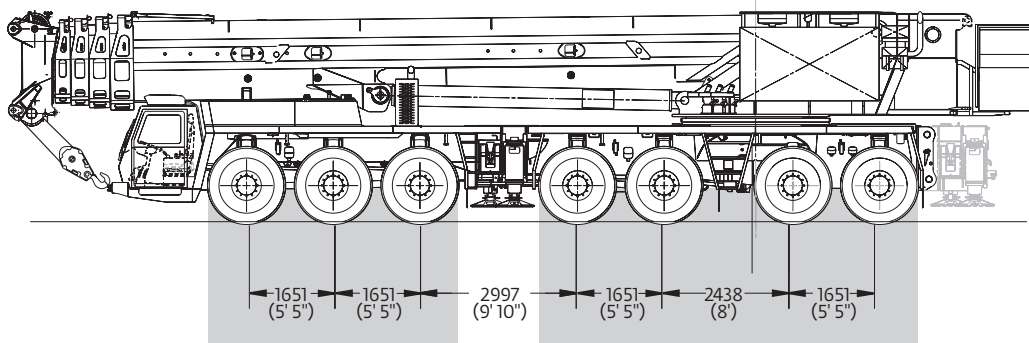
Allow 3% variation in weight due to manufacturing tolerances



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# Travel proposals

## Boom over front



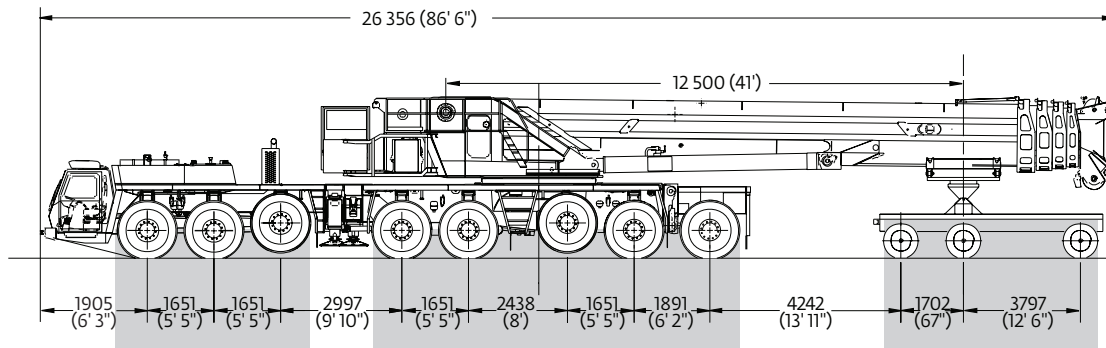
	Axles 1 - 3	Axles 4 - 7/8	Total GVW
Boom over front, rear outrigger box removed	37 724 kg (83,167 lb)	47 502 kg (104,722 lb)	85 226 kg (187,889 lb)
Boom over front, rear outrigger box installed	33 762 kg (74,431 lb)	58 193 kg (128,292 lb)	91 955 kg (202,723 lb)
Boom over front, 8th axle installed	43 562 kg (96,038 lb)	44 000 kg (97,003 lb)	87 563 kg (193,041 lb)

### Unit equipped with:

- 20.5 tires on aluminum rims
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware

Allow 3% variation in weight due to manufacturing tolerances

## Trailing boom (spread dolly) with axles 3 and 6 raised



	Axles 1 - 2	Axles 4, 5, 7, 8	Dolly	Total GVW
Boom in dolly over rear, rear outrigger box removed, 8th axle installed, axles 3 and 6 raised	23 899 kg (52,689 lb)	40 743 kg (89,821 lb)	27 485 kg (60,594 lb)	92 127 kg (203,104 lb)

### Unit equipped with:

- 20.5 tires on aluminum rims - axles 1 through 8
- Operator, 75 kg (165 lb)
- Welded on MEGAWINGLIFT hardware
- 3 axle dolly (4563 kg (10,000 lb))

Allow 3% variation in weight due to manufacturing tolerances

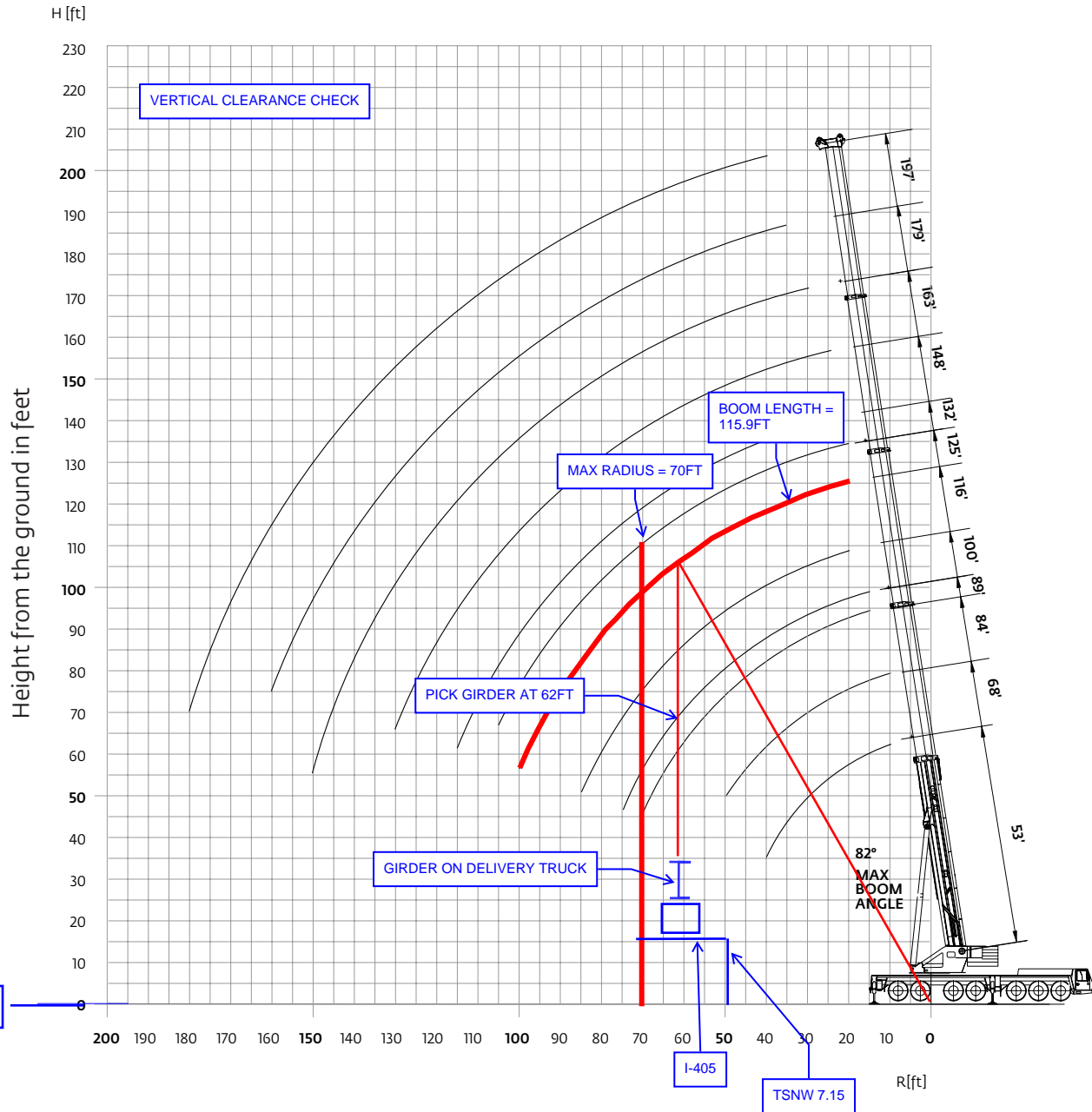


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# Working range

## Main boom

197 ft main boom



Operating radius in feet from axis of rotation

*Hook heights shown in the working diagram do not consider loaded boom deflection.*



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# Load charts

## Main boom

 16,0 m - 60 m  
(53 ft - 197 ft)
  120 000 kg  
(264,500 lb)
  29 ft 2 in spread  
(100%)
  360°

	Pounds (thousands)											
Feet	52.6	68.4	84.3	88.9	100.1	115.9	125.1	131.7	147.6	163.4	179.2	196.9
8	*1100.0											
10	678.0	624.0										
15	538.0	536.0	496.0	300.0								
20	438.0	442.0	438.0	300.0	410.0	372.0	284.0					
25	370.0	374.0	374.0	300.0	368.0	346.0	256.0	254.0				
30	318.0	320.0	320.0	298.0	318.0	316.0	232.0	228.0				
35	276.0	280.0	280.0	270.0	278.0	282.0	206.0	207.0	204.0	181.0		
40	242.0	244.0	246.0	238.0	244.0	246.0	187.0	186.0	186.0	168.0	146.0	123.0
45		215.0	216.0	209.0	219.0	217.0	170.0	170.0	154.0	142.0	131.0	119.0
50		194.0	196.0	185.0	195.0	193.0	154.0	155.0	141.0	131.0	122.0	112.0
55			176.0	165.0	175.0	174.0	143.0	145.0	129.0	121.0	114.0	105.0
60			159.0	147.0	159.0	157.0	132.0	136.0	120.0	111.0	106.0	98.0
65			144.0	136.0	144.0	142.0	121.0	128.0	111.0	104.0	98.0	92.0
70			131.0	122.0	130.0	127.0	111.0	119.0	102.0	97.0	92.0	86.0
75				109.0	117.0	114.0	104.0	113.0	96.0	90.0	87.0	80.0
80					106.0	104.0	95.0	107.0	90.0	83.0	81.0	76.0
85					97.0	94.0	86.0	98.0	84.0	79.0	75.0	72.0
90						87.0	78.0	90.0	79.0	75.0	71.0	67.0
95						84.0	70.0	82.0	75.0	70.0	68.0	63.0
100						79.0	64.0	76.0	72.0	66.0	64.0	60.0
105							59.0	70.0	69.0	62.0	60.0	57.0
110							56.0	65.0	66.0	59.0	56.0	54.0
115								61.0	62.0	56.0	53.0	51.0
120									57.0	52.0	51.0	47.0
125									54.0	49.0	49.0	45.0
130									50.0	47.0	46.0	43.4
135										46.0	44.0	41.4
140											43.4	39.6
145											40.6	37.6
150											38.2	35.8
155												33.6
160												31.4
165												29.4
170												27.6
175												25.8
180												24.2

Loads > 420,000 lb can only be lifted with additional equipment  
 \* Over rear, 20 ft outrigger span, with special equipment

 16,0 m - 60 m  
(53 ft - 197 ft)
  100 000 kg  
(220,400 lb)
  29 ft 2 in spread  
(100%)
  360°

	Pounds (thousands)											
Feet	52.6	68.4	84.3	88.9	100.1	115.9	125.1	131.7	147.6	163.4	179.2	196.9
8	*788.0											
10	664.0	624.0										
15	526.0	524.0	496.0	300.0								
20	428.0	432.0	432.0	300.0	410.0	372.0	284.0					
25	360.0	364.0	364.0	300.0	362.0	346.0	256.0	254.0				
30	308.0	312.0	312.0	298.0	310.0	314.0	232.0	228.0	204.0	181.0		
35	264.0	268.0	268.0	262.0	272.0	270.0	206.0	207.0	186.0	168.0	146.0	123.0
40	228.0	232.0	236.0	226.0	236.0	234.0	187.0	186.0	168.0	155.0	141.0	119.0
45		206.0	208.0	196.0	207.0	205.0	170.0	170.0	154.0	142.0	131.0	112.0
50		180.0	183.0	172.0	183.0	180.0	154.0	155.0	141.0	131.0	122.0	112.0
55			159.0	150.0	158.0	155.0	143.0	145.0	129.0	121.0	114.0	105.0
60			139.0	130.0	139.0	136.0	127.0	136.0	120.0	111.0	106.0	98.0
65			123.0	115.0	123.0	120.0	111.0	124.0	111.0	104.0	98.0	92.0
70			110.0	108.0	109.0	109.0	98.0	111.0	102.0	97.0	92.0	86.0
75				96.0	98.0	102.0	87.0	99.0	94.0	90.0	87.0	80.0
80					89.0	93.0	80.0	90.0	88.0	83.0	81.0	76.0
85					81.0	84.0	75.0	82.0	83.0	78.0	75.0	72.0
90						77.0	70.0	74.0	76.0	71.0	71.0	67.0
95						71.0	65.0	68.0	69.0	67.0	67.0	63.0
100						65.0	60.0	64.0	64.0	63.0	61.0	60.0
105							55.0	59.0	59.0	58.0	56.0	56.0
110							50.0	57.0	54.0	54.0	52.0	52.0
115								53.0	50.0	49.0	48.0	48.0
120									46.0	46.0	43.8	44.0
125									44.0	42.4	40.4	40.6
130									41.2	39.4	37.4	37.6
135										36.4	34.6	34.6
140										34.0	32.0	32.0
145										31.6	29.6	29.6
150										29.4	27.2	27.4
155											25.2	25.4
160											23.4	23.4
165												21.6
170												20.0
175												18.4
180												17.0

Loads > 420,000 lb can only be lifted with additional equipment  
 \* Over rear, 20 ft outrigger span, with special equipment



PORTLAND OFFICE: 503.283.3111  
 SEATTLE OFFICE: 206.784.1054  
[WWW.NESSCAMPBELL.COM](http://WWW.NESSCAMPBELL.COM)



# 550T WIRE ROPE DATA



5, Sandan 6-ro, Jeonggan-myeon, Gijang-gun, Busan, 46026, Korea  
TEL:+82-51-727-0015 FAX:+82-51-727-3247 www.kiswire.com

INVOICE NO. AW-6258/01

DATE Mar. 28, 2017

## MILL TEST CERTIFICATE

THIS IS TO CERTIFY THAT THE MATERIAL DESCRIBED BELOW WAS MANUFACTURED  
IN ACCORDANCE WITH KISWIRE LTD SPECIFICATION AND APPLICABLE SECTIONS

OF KISWIRE SPEC ( 2160 N/sq.mm )

TO MESSRS WEST COAST WIRE ROPE AND RIGGI

MATERIAL DESCRIPTION Hylift K16 (GALVANIZED) 35(W)xK7

6000 FT X 1 REEL

EX NO. AW-6258/01 UNIT WEIGHT(lbs/ft) 1.976

ORDER NO. K6932 REEL NO. 3 SAMPLING NO. 3

DIAMETER OF ROPE 24.000 mm TYPE OF CORE

SPECIFIED BREAKING LOAD 127,012.00 Lbs SAMPLE BROKE AT 133,099.58 Lbs

WT. OF ZINC COATING OF OUTER WIRE MIN. 73.000 g/m<sup>2</sup>

ROPE LAY RHLL LAY LENGTH 153.01 mm

LUBRICATION A-4

HIGH CARBON STEEL WIRE ROPE

COUNTRY OF ORIGIN : SOUTH KOREA

## CHEMICAL ANALYSIS OF WIRE ROD FOR OUTER

WIRE CHARGE NO.	C X 100	Si X 100	Mn X 100	P X 1000	S X 1000
SF79975	82	20	42	12	8

DATE OF SAMPLE TEST Feb. 06, 2017

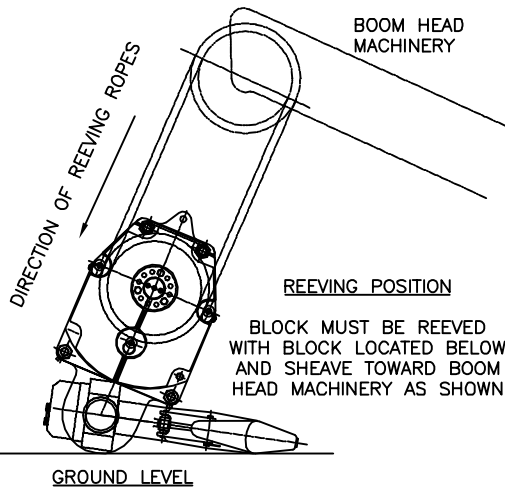
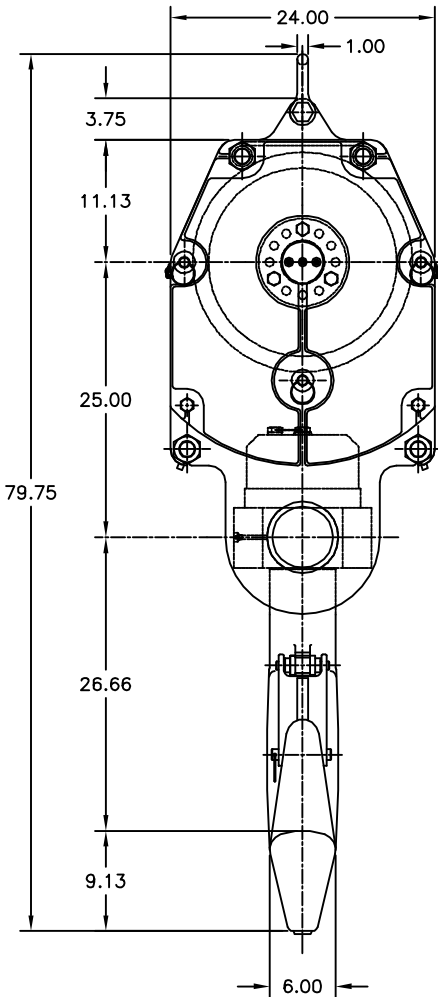
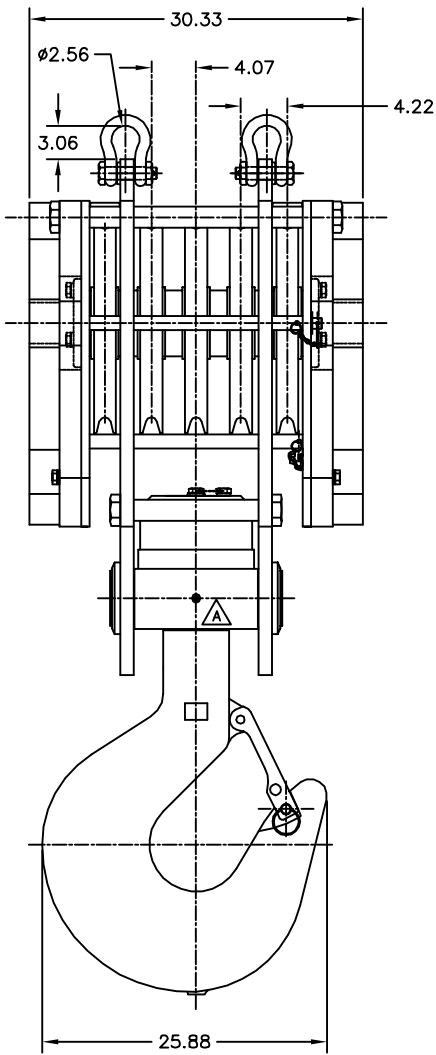
*S. H. Ham*

Approved by Q.C Manager S.H. Ham  
KISWIRE LTD., KOREA



550T LOAD BLOCK DATA

"NOTICE TO PERSONS RECEIVING THIS DRAWING:  
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issued in confidence for engineering information  
only and may not be reproduced or used to  
manufacture anything shown hereon without  
direct written permission from Gunnabo Johnson  
Corp. to the user."



- NOTES:
- ALL DIMENSIONS ARE FOR REFERENCE ONLY.
  - WORKING LOAD LIMIT: 125 TONS (250,000 LBS)  
DESIGN FACTOR 4 TO 1
  - BLOCK IS EQUIPPED WITH FIVE 20.0" O.D. SHEAVES.
  - SHEAVES ARE GROOVED FOR 24 MM WIRE ROPE,
  - SHEAVE GROOVES ARE FLAME HARDENED TO RC-35 MIN.
  - SHEAVES ROTATE ON STRAIGHT ROLLER BEARINGS THAT ARE INDIVIDUALLY LUBRICATED THROUGH FITTINGS LOCATED ON THE ENDS OF THE CENTER PIN.
  - BLOCK IS EQUIPPED WITH A CAST ALLOY STEEL HOOK.
  - HOOK ROTATES ON A STRAIGHT ROLLER THRUST BEARING THAT IS LUBRICATED THROUGH A FITTING LOCATED ON THE SIDE OF THE HOOK NUT.
  - HOOK IS EQUIPPED WITH A JOHNSON STEEL SAFETY LATCH.
  - HOOK OPENING: 6.50 WITHOUT LATCH & 5.62 WITH LATCH
  - DEAD END DESIGNED FOR GMK SOCKET G600

UNLESS NOTED TOLERANCES		ID NO		COMPONENT NO	QTY	DESCRIPTION	
.X = ±.1		DR		DT		GUNNEBO-JOHNSON CORP. TULSA, OKLAHOMA	
.XX = ±.03		DSN					
.XXX = ±.010		CHK		DW		TITLE	
.XXXX = ±.0005		APR		GMB		QRJ 125QN 20RTD	GMK-DIST
X* = ±5°		DATE				EN NO	DWG NO
ALL DIMENSIONS ARE IN INCHES		06/07/2000				15999_W	680711030
		SCALE		1:8		WT	SHEET
					3758		1 of 1

EDM FILED

DWG NO 680711030 SH 1

# 550T OUTRIGGER LOADS

---

**From:** compucrane@manitowoc.com  
**Sent:** Tuesday, November 30, 2021 10:47 AM  
**To:** Alexander, Ilima (external)  
**Subject:** Outrigger Pad Load Query

CAUTION: This email came from outside of the organization. Think before clicking on links and attachments.

GMK7550 w/ Main Boom Only - English Outrigger Pad Loads

Always confirm that the lifted load and configuration are approved in the load chart.

Boom Length: 100.1 ft [44-44-44-0]

Counterweight: 264500# Cwt

Outriggers: 28.7 x 29.2

Load Radius: 65 ft

Load Weight: 115000 lbs

Slew Angle: 0° = Directly Over Rear

51428 lbs Fwd-Lt

51428 lbs Fwd-Rt

235472 lbs Aft-Lt

235472 lbs Aft-Rt

Slew Angle: 45° = Over Rear Left Outrigger

129098 lbs Fwd-Lt

26978 lbs Fwd-Rt

284164 lbs Aft-Lt

133644 lbs Aft-Rt

Slew Angle: 90° = Directly Over Left Side

220248 lbs Fwd-Lt

64060 lbs Fwd-Rt

245290 lbs Aft-Lt

44218 lbs Aft-Rt

Slew Angle: 135° = Over Front Left Outrigger

279658 lbs Fwd-Lt

133050 lbs Fwd-Rt  
133604 lbs Aft-Lt  
27572 lbs Aft-Rt  
Slew Angle: 180° = Directly Over Front  
232964 lbs Fwd-Lt  
232964 lbs Fwd-Rt  
54020 lbs Aft-Lt  
54020 lbs Aft-Rt  
Slew Angle: 225° = Over Front Right Outrigger  
133050 lbs Fwd-Lt  
279658 lbs Fwd-Rt  
27572 lbs Aft-Lt  
133604 lbs Aft-Rt  
Slew Angle: 270° = Directly Over Right Side  
64060 lbs Fwd-Lt  
220248 lbs Fwd-Rt  
44218 lbs Aft-Lt  
245290 lbs Aft-Rt  
Slew Angle: 315° = Over Rear Right Outrigger  
26978 lbs Fwd-Lt  
129098 lbs Fwd-Rt  
133644 lbs Aft-Lt  
284164 lbs Aft-Rt  
Maximum Outrigger Pad Loads  
279658 lbs Fwd-Lt  
279658 lbs Fwd-Rt  
284164 lbs Aft-Lt  
284164 lbs Aft-Rt

Compu-Crane Support  
Manitowoc Cranes – Shady Grove  
T 1.800.348.0620  
Integrity, Commitment to Stakeholders, and Passion for Excellence.  
[\[http://image.manitowoc.com/en/safetyimage/worksafe.png\]](http://image.manitowoc.com/en/safetyimage/worksafe.png)

# RECo MEMO



3033 South Parker Road, Suite 1100, Aurora, CO 80014  
P. 303-790-1481 website: [www.reinforcedearth.com](http://www.reinforcedearth.com)

To: FLJV

Attention: Kevin Daniszewski

From: Blake Nelson

Subject: Walls 07.10R & 07.15R Crane Loading

Date: 12/3/2021

Total Pages: 6

☐ Fax No.:

☒ via e-mail

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Project: I-405 Widening

RECo No: 20024

Location: May Creek Bridge

State: Washington

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Analysis of Crane Loading  
SEW's 07.10R & 07.15R

As requested, we have reviewed the proposed girder erection plan with respect to the portions of walls 07.10R and 07.15R adjacent to the NB May Creek Bridge. The following is based on crane locations provided to The Reinforced Earth Company by FLJV via email.

The girder erection plan provided shows the proposed crane pad elevations, crane and outrigger locations for placing the bridge girders. Outrigger pad sizes and anticipated ground bearing pressures were not provided therefore, outrigger pads were assumed to be 8' x 10' with a maximum ground bearing pressure of 3.5 ksf. This assumed information is based on past experience and must be verified by the contractor prior to girder placement. Anticipated distances of the outrigger pads behind the retaining walls are shown on the attached calculations.

The SEW's were reviewed for external (sliding and overturning), and internal (soil reinforcement tension and pullout) stability, using parameters specified in the contract plans. It may be necessary for the site geotechnical engineer to review global stability and the anticipated bearing pressures.

Based on the information provided and the attached calculations, the SEW's can be expected to perform satisfactorily during girder placement. Also, we understand the field conditions and equipment placement may vary. Feel free to contract The Reinforced Earth Company should there be further concerns or if the proposed loading conditions vary outside the scope described above. Also, please feel free to contact us should there be any questions or comments.

Respectfully Submitted,  
THE REINFORCED EARTH COMPANY

A handwritten signature in blue ink, appearing to read "Blake Nelson", is written over a horizontal line.

Blake Nelson, P.E.  
Senior Engineer





12/03/21

JOB NUMBER :20024

DESIGNED : BLN

COMMENTS: 07.10R Crane Loading, Col. 64-65

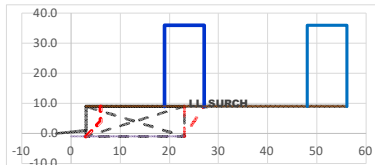
**MASS STABILITY AND MAXIMUM BEARING PRESSURE - LRFD STATIC , TRIALWEDGE ANALYSIS METHOD****H = 10.00ft, H'(active zone) = 10.00ft, B = 20.00ft**

AASHTO - LRFD 2017- DESIGN TYPE : LEVEL SURCHARGE

Equiv. height Traffic Live Load Surcharge= 0.00ft or 0.00Ksf , 1st , Equiv. height Train/Crane Surch. 26.92ft or 3.50Ksf @ 16.00ft from panel &amp; over 8.00ft width. 2nd Equiv. Train/Crane Surch. 26.92ft or 3.50Ksf @ 45.00ft from panel &amp; over 8.00ft

Foundation, Coeff. of friction @ bott/wall=0.73, Cohesion=0.00Ksf, Tributary width= 9.84ft

f\* = Coefficient of apparent friction @ finished grade = 2.00

Select Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Cohes=0.00Ksf -**STATIC MASS STABILITY**

FACTORED VERTICAL LOADS (Kips)		Arm (ft)	Moment (Kip-ft)	
26.00	26.00	10.00	260.0	260.00
0.00		20.00	0.0	
0.00		20.00	0.0	
0.00		0.00	0.0	
14.00	Strip Load #1	18.00	252.0	
0.00	Strip Load #2	45.00	0.0	
0.00	VertComp.Pa	20.00	0.0	
0.00	VertComp.Ps	20.00	0.0	
5.33	VertComp.Ppsv	20.00	106.59	
45.33			618.56	

**FACTORED HORIZONTAL LOADS, TRIALWEDGE METHOD, Critical Angle w/Horiz= 68.00°**

1.92	HorizCompontPa	3.33	6.40	Soil
0.00	HorizCompontPs	5.00	0.00	Traffic LiveLoad
11.97	HorizComp.Ppsv	7.38	88.35	Train/Crane Surch
13.89			94.75	

**CAPACITY/DEMAND RATIO (CDR)**

- 1) OVERTURNING 6.53  $\geq 1.0$ , OK  
2) SLIDING 2.37  $\geq 1.0$ , OK

**Bearing Pressure****STATIC MASS STABILITY**

			Arm (ft)	MOMENT (Kip-ft)		
1.35DL	1.00DL	1DL +0.0LL		1.35DL	1.00DL	1DL +0.0LL
35.10	26.00	26.00	19.69	351.0	512.0	512.0
21.00	21.00	21.00	18.00	378.0	378.0	378.0
5.33	5.33	5.33	20.00	106.6	106.6	106.6
0.00	0.00	0.00	0.00	0.0	0.0	0.0
61.43	52.33	52.33		835.5	996.5	996.5

HORIZONTAL LOADS ( SAME AS FOR MASS STABILITY, static case)

1.35DL factor, Eccent. = -2.06ft  $\leq B/3.00 = 6.67\text{ft}$ , OK, , Factored Bearing Pressure = 3.07Ksf1.00DL, Eccent. = -7.23ft  $\leq B/3.00$  , Factored BP = 2.62Ksf

1.00DL+0.0 LL, Eccent. = -7.23ft, Factored BP = 2.62Ksf

Unfactored Bearing Pressure @ toe of wall = 2.15Ksf

**REINFORCED EARTH INTERNAL STABILITY SUMMARY - Coherent Gravity MethodCruciform or Square Panels**

Steel Strips

LEVEL	Factored Horiz. Stress $\sigma_h$ @ Fac'g -Ksf	Density Strips 50x4mm	Factored Tension $\leq 11.34\text{Kips}$	Factored Stress $\sigma_h$ (Bond)-Ksf	Effective Length CDR $\geq 1.0$	Reinforc. Length	Minimum Density Req'd
1.000	0.46	3	3.75	0.57	2.03	20.00ft	(1.48)
3.850	0.66	3	5.77	0.73	1.84	20.00ft	(1.63)
6.310	0.81	3	6.57	0.85	1.97	20.00ft	(1.74)
8.770	0.95	3	7.66	0.95	1.99	20.00ft	(2.03)

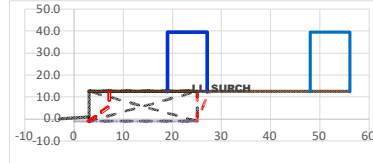
**MASS STABILITY AND MAXIMUM BEARING PRESSURE - LRFD STATIC , TRIALWEDGE ANALYSIS METHOD**
**H = 13.60ft, H'(active zone) = 13.60ft, B = 22.00ft**

AASHTO - LRFD 2017- DESIGN TYPE : LEVEL SURCHARGE

Equiv. height Traffic Live Load Surcharge= 0.00ft or 0.00Ksf , 1st , Equiv. height Train/Crane Surch. 26.92ft or 3.50Ksf @ 16.00ft from panel &amp; over 8.00ft width. 2nd Equiv. Train/Crane Surch. 26.92ft or 3.50Ksf @ 45.00ft from panel &amp; over 8.00ft

Foundation,Coeff. of friction@ bott/wall=0.73, Cohesion=0.00Ksf, Tributary width= 9.84ft

f\*= Coefficient of apparent friction @finished grade = 2.00

Select Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand.Cohes=0.00Ksf -

**STATIC MASS STABILITY**

FACTORED VERTICAL LOADS (Kips)		Arm (ft)	Moment (Kip-ft)	
38.90	38.90	11.00	427.9	427.86
0.00		22.00	0.0	
0.00		22.00	0.0	
0.00		0.00	0.0	
21.00	Strip Load #1	19.00	399.0	
0.00	Strip Load #2	45.00	0.0	
0.00	VertComp.Pa	22.00	0.0	
0.00	VertComp.Ps	22.00	0.0	
3.69	VertComp.Ppsv	22.00	81.08	
63.58			907.89	

**FACTORED HORIZONTAL LOADS, TRIALWEDGE METHOD, Critical Angle w/Horiz= 80.00°**

2.15	HorizCompontPa	4.53	9.72	Soil
0.00	HorizCompontPs	6.80	0.00	Traffic LiveLoad
8.28	HorizComp.Ppsv	11.23	92.92	Train/Crane Surch
10.42			102.64	

**CAPACITY/DEMAND RATIO (CDR)**

1) OVERTURNING	8.85	>=1.0, OK
2) SLIDING	4.43	>=1.0, OK

**Bearing Pressure**
**STATIC MASS STABILITY**

			Arm (ft)	MOMENT (Kip-ft)		
	1.35DL	1.00DL	1DL +0.0LL	1.35DL	1.00DL	1DL +0.0LL
52.51	38.90	38.90	21.26	577.6	826.8	826.8
31.50	31.50	31.50	19.00	598.4	598.4	598.4
3.69	3.69	3.69	22.00	81.1	81.1	81.1
0.00	0.00	0.00	0.00	0.0	0.0	0.0
87.69	74.08	74.08		1257.1	1506.3	1506.3

HORIZONTAL LOADS ( SAME AS FOR MASS STABILITY, static case)

1.35DL factor, Eccent. = -2.17ft&lt;= B/ 3.00 =7.33ft, OK, , Factored Bearing Pressure = 3.99Ksf

1.00DL, Eccent. = -7.95&lt;= B/ 3.00 , Factored BP = 3.37Ksf

1.00DL+0.0 LL, Eccent. = -7.95ft, Factored BP = 3.37Ksf

Unfactored Bearing Pressure @ toe of wall = 2.82Ksf

**REINFORCED EARTH INTERNAL STABILITY SUMMARY - Coherent Gravity MethodCruciform or Square Panels**

Steel Strips

LEVEL	Factored Horiz. Stress $\sigma_h$ @ Fac'g -Ksf	Density Strips 50x4mm	Factored Tension ≤ 11.34Kips	Factored Stress $\sigma_h$ (Bond)-Ksf	Effective Length CDR ≥ 1.0	Reinforc. Length	Minimum Density Req'd
1.000	0.60	3	4.82	0.75	2.21	22.00ft	(1.36)
3.760	0.77	3	6.56	0.89	2.02	22.00ft	(1.74)
6.220	0.90	3	7.26	1.01	2.07	22.00ft	(1.92)
8.680	1.02	3	8.20	1.10	2.04	22.00ft	(2.17)
11.140	1.12	3	9.00	1.19	2.02	22.00ft	(2.38)
12.370	1.16	3	9.35	1.22	2.01	22.00ft	(2.48)

**MASS STABILITY AND MAXIMUM BEARING PRESSURE - LRFD STATIC , TRIALWEDGE ANALYSIS METHOD**
**H = 17.30ft, H'(active zone) = 17.30ft, B = 24.00ft**

AASHTO - LRFD 2017- DESIGN TYPE : LEVEL SURCHARGE

Equiv. height Traffic Live Load Surcharge= 0.00ft or 0.00Ksf , 1st , Equiv. height Train/Crane Surch. 26.92ft or 3.50Ksf @ 18.00ft from panel &amp; over 8.00ft width. 2nd Equiv. Train/Crane Surch. 26.92ft or 3.50Ksf @ 48.00ft from panel &amp; over 8.00ft

Foundation,Coeff. of friction@ bott/wall=0.73, Cohesion=0.00Ksf, Tributary width= 9.84ft

f\*= Coefficient of apparent friction @finished grade = 2.00

Select Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand.Cohes=0.00Ksf -

**STATIC MASS STABILITY**

FACTORED VERTICAL LOADS (Kips)		Arm (ft)	Moment (Kip-ft)	
53.98	53.98	12.00	647.7	647.71
0.00		24.00	0.0	
0.00		24.00	0.0	
0.00		0.00	0.0	
21.00	Strip Load #1	21.00	440.9	
0.00	Strip Load #2	48.00	0.0	
0.00	VertComp.Pa	24.00	0.0	
0.00	VertComp.Ps	24.00	0.0	
2.91	VertComp.Ppsv	24.00	69.94	
77.89			1158.60	

**FACTORED HORIZONTAL LOADS, TRIALWEDGE METHOD, Critical Angle w/Horiz= 71.00°**

5.37	HorizCompontPa	5.77	30.97	Soil
0.00	HorizCompontPs	8.65	0.00	Traffic LiveLoad
6.55	HorizComp.Ppsv	15.85	103.72	Train/Crane Surch
11.92			134.69	

**CAPACITY/DEMAND RATIO (CDR)**

- 1) OVERTURNING 8.60  $\geq 1.0$ , OK  
2) SLIDING 4.75  $\geq 1.0$ , OK

**Bearing Pressure**
**STATIC MASS STABILITY**

			Arm (ft)	MOMENT (Kip-ft)		
	1.35DL	1.00DL	1DL +0.0LL	1.35DL	1.00DL	1DL +0.0LL
72.87	53.98	53.98	20.17	874.4	1088.7	1088.7
31.50	31.50	31.50	21.00	661.4	661.4	661.4
2.91	2.91	2.91	24.00	69.9	69.9	69.9
0.00	0.00	0.00	0.00	0.0	0.0	0.0
107.28	88.39	88.39		1605.8	1820.0	1820.0

HORIZONTAL LOADS ( SAME AS FOR MASS STABILITY, static case)

1.35DL factor, Eccent. = -1.71ft  $\leq B/3.00 = 8.00\text{ft}$ , OK, , Factored Bearing Pressure = 4.47Ksf

1.00DL, Eccent. = -7.07ft  $\leq B/3.00$  , Factored BP = 3.68Ksf

1.00DL+0.0 LL, Eccent. = -7.07ft, Factored BP = 3.68Ksf

Unfactored Bearing Pressure @ toe of wall = 3.19Ksf

**REINFORCED EARTH INTERNAL STABILITY SUMMARY - Coherent Gravity MethodCruciform or Square Panels**

Steel Strips

LEVEL	Factored Horiz. Stress $\sigma_h$ @ Fac'g -Ksf	Density Strips 50x4mm	Factored Tension $\leq 11.34\text{Kips}$	Factored Stress $\sigma_h$ (Bond)-Ksf	Effective Length CDR $\geq 1.0$	Reinforc. Length	Minimum Density Req'd
1.000	0.55	3	4.45	0.69	2.41	24.00ft	(1.25)
2.540	0.65	3	5.22	0.78	2.36	24.00ft	(1.38)
5.000	0.79	3	6.34	0.90	2.27	24.00ft	(1.68)
7.460	0.91	3	7.34	1.01	2.17	24.00ft	(1.94)
9.920	1.02	3	8.21	1.10	2.10	24.00ft	(2.17)
12.380	1.11	3	8.95	1.18	2.07	24.00ft	(2.37)
14.840	1.18	3	9.56	1.24	2.01	24.00ft	(2.53)
16.070	1.22	3	9.81	1.26	1.97	24.00ft	(2.60)

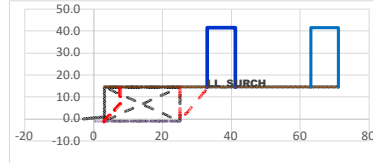
**MASS STABILITY AND MAXIMUM BEARING PRESSURE - LRFD STATIC , TRIALWEDGE ANALYSIS METHOD**
**H = 15.60ft, H'(active zone) = 15.60ft, B = 22.00ft**

AASHTO - LRFD 2017- DESIGN TYPE : LEVEL SURCHARGE

Equiv. height Traffic Live Load Surcharge= 0.00ft or 0.00Ksf , 1st , Equiv. height Train/Crane Surch. 26.92ft or 3.50Ksf @ 30.00ft from panel &amp; over 8.00ft width. 2nd Equiv. Train/Crane Surch. 26.92ft or 3.50Ksf @ 60.00ft from panel &amp; over 8.00ft

Foundation, Coeff. of friction @ bott/wall=0.62, Cohesion=0.00Ksf, Tributary width= 9.84ft

f\*= Coefficient of apparent friction @ finished grade = 2.00

Select Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Cohes=0.00Ksf -

**STATIC MASS STABILITY**

FACTORED VERTICAL LOADS (Kips)	Arm (ft)	Moment (Kip-ft)
44.62	11.00	490.8
0.00	22.00	0.0
0.00	22.00	0.0
0.00	0.00	0.0
0.00 Strip Load #1	0.00	0.0
0.00 Strip Load #2	0.00	0.0
0.00 VertComp.Pa	22.00	0.0
0.00 VertComp.Ps	22.00	0.0
8.74 VertComp.Ppsv	22.00	192.33
53.36		683.10

**FACTORED HORIZONTAL LOADS, TRIALWEDGE METHOD, Critical Angle w/Horiz= 62.00°**

5.06 HorizCompontPa	5.20	26.29 Soil
0.00 HorizCompontPs	7.80	0.00 Traffic LiveLoad
19.64 HorizComp.Ppsv	11.15	219.03 Train/Crane Surch
24.69		245.31

**CAPACITY/DEMAND RATIO (CDR)**

- 1) OVERTURNING 2.78  $\geq 1.0$ , OK  
2) SLIDING 1.35  $\geq 1.0$ , OK

**Bearing Pressure**
**STATIC MASS STABILITY**

			Arm (ft)	MOMENT (Kip-ft)		
1.35DL	1.00DL	1DL +0.0LL		1.35DL	1.00DL	1DL +0.0LL
60.23	44.62	44.62	11.00	662.5	490.8	490.8
0.00	0.00	0.00	0.00	0.0	0.0	0.0
8.74	8.74	8.74	22.00	192.3	192.3	192.3
0.00	0.00	0.00	0.00	0.0	0.0	0.0
68.97	53.36	53.36		854.9	683.1	683.1

HORIZONTAL LOADS ( SAME AS FOR MASS STABILITY, static case)

1.35DL factor, Eccent. = 2.16ft  $\leq B/3.00 = 7.33\text{ft}$ , OK, , Factored Bearing Pressure = 3.90Ksf

1.00DL, Eccent. = 2.80ft  $\leq B/3.00$  , Factored BP = 3.25Ksf

1.00DL+0.0 LL, Eccent. = 2.80ft, Factored BP = 3.25Ksf

Unfactored Bearing Pressure @ toe of wall = 2.69Ksf

**REINFORCED EARTH INTERNAL STABILITY SUMMARY - Coherent Gravity MethodCruciform or Square Panels**

Steel Strips

LEVEL	Factored Horiz. Stress $\sigma_h$ @ Fac'g -Ksf	Density Strips 50x4mm	Factored Tension $\leq 11.34\text{Kips}$	Factored Stress $\sigma_h$ (Bond)-Ksf	Effective Length CDR $\geq 1.0$	Reinforc. Length	Minimum Density Req'd
2.500	0.20	3	1.60	0.17	2.20	22.00ft	(1.37)
4.530	0.35	3	2.80	0.30	2.13	22.00ft	(1.41)
6.990	0.51	3	4.13	0.44	2.03	22.00ft	(1.48)
9.450	0.69	3	5.54	0.56	2.04	22.00ft	(1.47)
11.910	0.86	3	6.97	0.67	2.07	22.00ft	(1.84)
14.370	1.04	3	8.39	0.76	2.07	22.00ft	(2.22)

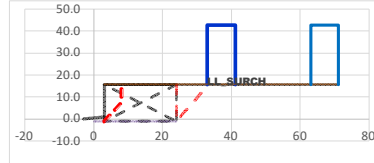
**MASS STABILITY AND MAXIMUM BEARING PRESSURE - LRFD STATIC , TRIALWEDGE ANALYSIS METHOD**
**H = 16.70ft, H'(active zone) = 16.70ft, B = 21.00ft**

AASHTO - LRFD 2017- DESIGN TYPE : LEVEL SURCHARGE

Equiv. height Traffic Live Load Surcharge= 0.00ft or 0.00Ksf , 1st , Equiv. height Train/Crane Surch. 26.92ft or 3.50Ksf @ 30.00ft from panel &amp; over 8.00ft width. 2nd Equiv. Train/Crane Surch. 26.92ft or 3.50Ksf @ 60.00ft from panel &amp; over 8.00ft

Foundation, Coeff. of friction @ bott/wall=0.62, Cohesion=0.00Ksf, Tributary width= 9.84ft

f\* = Coefficient of apparent friction @ finished grade = 2.00

Select Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Fill  $\gamma=0.130\text{Kcf}$ ,  $\Phi=36.00^\circ$ , Rand. Cohes=0.00Ksf -

**STATIC MASS STABILITY**

FACTORED VERTICAL LOADS (Kips)	Arm (ft)	Moment (Kip-ft)
45.59	10.50	478.7
0.00	21.00	0.0
0.00	21.00	0.0
0.00	0.00	0.0
0.00 Strip Load #1	0.00	0.0
0.00 Strip Load #2	0.00	0.0
0.00 VertComp.Pa	21.00	0.0
0.00 VertComp.Ps	21.00	0.0
8.42 VertComp.Ppsv	21.00	176.87
54.01		655.58

**FACTORED HORIZONTAL LOADS, TRIALWEDGE METHOD, Critical Angle w/Horiz= 61.00°**

5.82 HorizCompontPa	5.57	32.40	Soil
0.00 HorizCompontPs	8.35	0.00	Traffic LiveLoad
18.92 HorizComp.Ppsv	12.36	233.77	Train/Crane Surch
24.74		266.16	

**CAPACITY/DEMAND RATIO (CDR)**

- 1) OVERTURNING 2.46  $\geq 1.0$ , OK  
2) SLIDING 1.36  $\geq 1.0$ , OK

**Bearing Pressure**

STATIC MASS STABILITY			Arm (ft)	MOMENT (Kip-ft)		
1.35DL	1.00DL	1DL +0.0LL		1.35DL	1.00DL	1DL +0.0LL
61.55	45.59	45.59	10.50	646.3	478.7	478.7
0.00	0.00	0.00	0.00	0.0	0.0	0.0
8.42	8.42	8.42	21.00	176.9	176.9	176.9
0.00	0.00	0.00	0.00	0.0	0.0	0.0
69.97	54.01	54.01		823.1	655.6	655.6

HORIZONTAL LOADS ( SAME AS FOR MASS STABILITY, static case)

1.35DL factor, Eccent. = 2.54ft  $\leq B/3.00 = 7.00\text{ft}$ , OK, , Factored Bearing Pressure = 4.40Ksf

1.00DL, Eccent. = 3.29ft  $\leq B/3.00$  , Factored BP = 3.75Ksf

1.00DL+0.0 LL, Eccent. = 3.29ft, Factored BP = 3.75Ksf

Unfactored Bearing Pressure @ toe of wall = 2.99Ksf

**REINFORCED EARTH INTERNAL STABILITY SUMMARY - Coherent Gravity MethodCruciform or Square Panels**

Steel Strips

LEVEL	Factored Horiz. Stress $\sigma_h$ @ Fac'g -Ksf	Density Strips 50x4mm	Factored Tension $\leq 11.34\text{Kips}$	Factored Stress $\sigma_h$ (Bond)-Ksf	Effective Length CDR $\geq 1.0$	Reinforc. Length	Minimum Density Req'd
2.500	0.20	3	1.59	0.17	2.03	21.00ft	(1.48)
5.630	0.42	3	3.85	0.36	1.70	21.00ft	(1.77)
8.090	0.59	3	4.77	0.50	1.84	21.00ft	(1.63)
10.550	0.77	3	6.22	0.61	1.88	21.00ft	(1.65)
13.010	0.95	3	7.68	0.71	1.91	21.00ft	(2.03)
15.470	1.13	3	9.15	0.80	1.89	21.00ft	(2.42)